

## FINDING OF NO SIGNIFICANT IMPACT

### PITTSBURGH FEDERAL 2H AND 3H OIL WELLS CONSTRUCTION GARRISON PROJECT, MCKENZIE COUNTY, NORTH DAKOTA

**Introduction:** In accordance with the National Environmental Policy Act and implementing regulations, an Environmental Assessment (EA), incorporated by reference herein, has been prepared to evaluate the effects of Newfield Production Company's proposed Pittsburgh Federal 2H and 3H oil well construction on U.S. Army Corps of Engineers (Corps) managed land at the Garrison Project in McKenzie County, North Dakota. The EA was prepared by Kleinfelder/Buys & Associates, Inc (Kleinfelder) for Newfield Production Company (Newfield) and the Corp would adopt this EA and incorporate findings within as part of stipulations to issue a real estate easement to Newfield for the proposed activity.

This action is being completed in accordance with the Center of Environmental Quality (CEQ) regulations in Section 1506.5(a) and 1506.5(b), which allows an applicant to prepare an EA for a federal action. The Corps has independently evaluated and verified the information and analysis undertaken in this EA and takes full responsibility for the scope and content contained herein. Names of those involved with the preparation and review of this document are provided in Section 10.0 of the EA.

**Project Summary:** Newfield proposes to construct two exploratory oil and gas wells on one well pad to determine if it is economically feasible to extract minerals from the Bakken Formation (shale rock) approximately two miles under Lake Sakakawea. The pad would be located about a half mile south of Lake Sakakawea in the Charleson Oil Field on the Garrison Project in North Dakota. More specifically, the public land and survey system describes the wells as being located in the NW  $\frac{1}{4}$  of the NE  $\frac{1}{4}$  of Section 34, Township 154 North and Range 96 West in McKenzie County, North Dakota.

**Alternatives:** Four alternatives were considered in order to implement the proposed action. Two alternatives were screened out from detailed consideration due to associated negative environmental impacts (butterfly habitat), cultural resource sites and inability for alternative exploratory process (seismic survey) to produce any useful information. The two remaining alternatives include (1) Approve Applicant's Proposal (build the well pad with interagency coordination and implement recommended mitigation measures) (**RECOMMENDED PLAN**) and (2) the No Action Alternative.

**Recommended Plan:** The Recommended Plan would enable the construction of a 5.62 acre well pad and a 208 foot access road to accommodate and allow access to two wells that would explore for oil and gas in the Bakken formation. Both wells will be co-located on the same well pad, will be drilled to approximately 10,000 feet deep, and will have approximately 5,000 feet of additional lateral boring. The well bore will be drilled with fresh water only to 1,400 feet and cased to 1,321 feet, which is 50 feet below the deepest fresh water bearing aquifer (Fox Hills). The casing would be completely enclosed by cement and would prevent any unintentional migration of chemical-containing drilling and fracturing fluids from entering groundwater resources. All fluids used in drilling will be contained in closed steel tanks placed on impervious liners, collected by centrifuging returns and recycled for continual re-use during the drilling process. Upon completion of drilling operations at each location, the oil-based fluids will be collected to the extent possible (usually over 95%) for use elsewhere. A complete closed loop mud and fluid

system will be used for all drilling operations; all non-recyclable fluids (remaining 5%), including fresh water, and cuttings generated will be hauled off-site and disposed of at a state approved facility.

After the simultaneous drilling and completion of the wells is complete, a completion (work-over) unit would be moved onto the site. Completion of the well involves cleaning out the well bore, pressure testing the casing, perforating and fracturing the horizontal portion of the hole (hydraulic fracturing) and running production tubing for commercial production. After fracturing, the well flows back to the surface to recover fracture fluids and remove excess sand. Fluids utilized in the completion procedure would be captured in enclosed tanks and disposed of at a state approved facility.

If commercial production is supported from either of the proposed wells, additional equipment would be installed and these facilities would be located as close as possible to each other to allow the maximum amount of interim reclamation of the well pad. The well pad would be reduced to 3.57 acres during the production life of the well. Produced oil would be collected in tanks installed on location and periodically trucked to an existing oil terminal until a connection to an existing pipeline is approved and installed. Any produced water would be captured in tanks and periodically trucked to a state approved disposal site. All tanks would sit on impervious liners and be surrounded by steel containment berms capable of holding at least 110% of the largest tanks volume within the berm. The duration of production operations cannot be reliably predicted, but generally the average life of a productive well in this area is five to twenty years. Once operations end, full reclamation of all disturbed areas will be completed and the easement forfeited back to the Corps.

**Summary of Environmental Impact:** The recommended plan would result in no adverse impacts to any Federally-listed threatened or endangered species or their habitat. The recommended plan would result in no impacts to any properties listed, proposed for listing, eligible for listing, or potentially eligible for listing in the National Register of Historic Places. Areas near the well pads will be temporarily disturbed by proposed construction activities. The impacts associated with the proposed project construction are short term and minor. If the results of the exploration are favorable, the site may be occupied by mineral extraction equipment for five to twenty years. Of the four alternatives considered, the Recommended Plan is proposed because it can be reasonably implemented, meets the projects purpose and need, incorporates sound mitigation and is consistent with protection of the nation's environment.

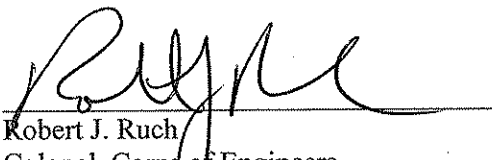
**Mitigation Measures:** The recommended plan will have minor impacts (i.e., noise, earth disturbance, vegetation removal, etc.) on the environment. Best management practices (BMP) as identified in the BLM and the U.S. Forest Service's "Gold Book" along with Garrison Project BMP will be implemented during all phases of construction, drilling, hydraulic fracturing, production and reclamation. These measures include, but are not limited to: pre-construction noxious weed surveys, weed management control measures, use of earthen berms to reduce visual pollution of flare stacks, painting structures to blend in with surrounding environment, constructing outside migratory bird nesting season, re-seeding with native species, stopping work if cultural resources are encountered, etc. Initial impact to 5.62 acres will be reduced to 3.57 acres during the production life of the well. Upon completion of the entire project, all disturbed land will be reclaimed and restored to pre-project conditions. All facilities will be removed, well bores will be plugged with cement and dry hole markers will be set. Access roads and the well pad would be leveled or backfilled as necessary, re-contoured to approximate original contours, evenly spread with stored topsoil (if available) and re-seeded with native vegetation. An

exception to these reclamation measures might occur if the Corps approves assignment of the access road to the Corps roads inventory.

**Coordination:** The proposed action has been designed in such a way as to incorporate specific monitoring and mitigation measures (including impact avoidance and minimization) developed by Corps in coordination with other resource agencies. As such, the proposed action will only have localized, minor and short term impacts and will not impact or interfere with the authorized project purposes. In addition, the proposed work is in compliance with all applicable Federal, state and local laws and regulations.

**Conclusion:** After evaluating the anticipated environmental, economic and social effects of the proposed activity, it is my determination that allowing a real estate easement for the construction of the proposed Pittsburgh Federal 2H and 3H oil wells on Corps owned land does not constitute a major Federal action that would significantly affect the quality of the human environment. The proposed action has been coordinated with the appropriate resource agencies and there are no significant unresolved issues; therefore, preparation of an Environmental Impact Statement is not required.

14 Oct 2011  
Date

  
Robert J. Ruch  
Colonel, Corps of Engineers  
District Commander

# **ENVIRONMENTAL ASSESSMENT**

## **Pittsburgh Federal 2H and 3H Oil Wells**

### **United States Army Corps of Engineers**

Omaha District  
Garrison Project Office  
Riverdale, North Dakota

### **Newfield Production Company**

Denver, CO

**August 2011**

**Environmental Assessment  
Pittsburgh Federal 2H and 3H Oils Wells  
McKenzie, County, North Dakota**

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**Environmental Assessment**  
**Proposed Pittsburgh Federal 2H and 3H Oil Wells**  
**McKenzie County, North Dakota**

**EXECUTIVE SUMMARY**

Newfield Production Company (Newfield) has proposed to drill two exploratory horizontal oil wells on land owned by the U.S. Army Corps of Engineers (Corps). The wells are planned adjacent to each other on one well pad in the NW $\frac{1}{4}$  of the NE $\frac{1}{4}$  of Section 3, T153N, R96W, which is about 0.5 miles south of Lake Sakakawea in the Charleson Oil Field. The total surface disturbance of the well pad would be approximately 5.62 acres. Access to the location would be from an existing oil and gas road. The proposed access road would run in a northwesterly direction in the NW $\frac{1}{4}$  of Section 3, T153N, R96W for a length of about 208 feet (0.04 miles). A maximum disturbed right-of-way (ROW) width of 40 feet for the road would result in 0.19 acres of surface disturbance. The proposed pipelines and utility line would require expansion of the disturbance corridor along the proposed access road. A maximum disturbed ROW width of 30 feet for the pipelines and utility line would result in 0.14 acres of additional surface disturbance.

Construction and operation activities would follow all standards, guidelines, and practices for oil development in the region. Site specific actions would include construction of the access road and well pad, drilling operations, installation of production facilities, tanker traffic and reclamation. A closed loop drilling system would be utilized in which all cuttings and produced fluids used for drilling would be collected and disposed of in an off-site, state-approved facility. If the well proves to be productive, the working portions of the well pad and the access road would remain in place during commercial production. Interim reclamation measures to be accomplished include: spreading the topsoil from the road running surface to the edge of cut and fills, and seeding/mulching of the topsoil areas, borrow ditches, and travel surface with a seed mixture and/or certified weed-free mulch approved by the Corps. This would reduce long-term well pad disturbance to a maximum of 3.57 acres, long-term access road disturbance to a maximum of about 16 feet wide (0.08 acres), and long-term pipeline/utility ROW disturbance to a maximum of about 15 feet wide (0.07 acres). All project components would eventually be abandoned and reclaimed.

The proposed well pad is on a high ridge crest/plateau overlooking Lake Sakakawea, with steep wooded draws beyond the well pad area to the southwest and southeast. The access road joins the well pad on the east side. The vegetation and wildlife habitat of the site are typical of the area, with no significant areas affected. Potential environmental impacts to the site would be minor. No surface waters or wetland/riparian habitats would be significantly affected by the project. The potential to contaminate groundwater would be minimized by cementing casing and the use of freshwater mudding when drilling through freshwater bearing zones. Best management practices (BMPs) would be implemented to control soil erosion and the spread of noxious weed populations. The project may effect, but is not likely to adversely affect any threatened, endangered, or species of concern that may be present in the region. Construction and drilling activities may cause temporary displacement of wildlife because of noise disturbances from construction activities and a localized decrease in air quality due to factors such as dust and engine exhausts. However, long-term vegetation and wildlife habitat loss will be minimal, with interim and/or final reclamation planned to re-establish pre-construction conditions. No substantial effects are expected for noise levels or socioeconomics of the area. Thirteen previously recorded historic properties and ten cultural resource inventories were identified within the project area. The closest of the historic properties is more than 1,700 feet from the proposed well location. None of the previously recorded historic properties will be impacted by the proposed project.

## 1.0 INTRODUCTION

Lake Sakakawea, formed by the Garrison Dam on the Missouri River in west-central North Dakota, along with the adjacent shoreline, is under the stewardship of the U.S. Army Corps of Engineers (Corps), Garrison Project Office (GPO), Omaha District. The proposed location for the Pittsburgh Federal 2H and 3H well pad and access road occurs within lands owned and administered by the GPO. This area falls under Corps jurisdiction and surface ownership because of its proximity to Lake Sakakawea. Newfield Production Company (Newfield) of Denver, Colorado (the applicant) has proposed to drill two exploratory oil and gas wells on Corps-administered land within one mile of Lake Sakakawea. The Corps must evaluate the proposal and decide whether its approval will result in a significant impact upon the human environment, thereby prompting the preparation of an Environmental Impact Statement (EIS), or if a Finding of No Significant Impact (FONSI) is appropriate.

The operation of the upper Missouri River's six mainstem reservoirs and the lower Missouri River's levees and navigation channel provides for flood control, navigation, irrigation, hydropower, municipal and industrial water supply, fish and wildlife, water quality, and recreation. The Corps manages its lands for long-term public access to, and use of, natural resources in cooperation with other Federal, State, and local agencies as well as the private sector. The Civil Works mission of the Corps includes the protection, restoration, and management of the natural environment. Furthermore, the Corps must ensure that activities on Corps lands are done in an environmentally sustainable, economic, and technically sound manner and follow all laws and regulations at all governmental levels (USACE 2007).

All Corps decisions must consider the conservation, environmental preservation and restoration principles described above. To comply with the National Environmental Policy Act (NEPA) of 1969 and related environmental laws and regulations, the Corps must thoroughly consider the potential environmental effects of its decisions regarding approval of projects proposed on Corps-owned and administered land and avoid and minimize adverse environmental effects to the extent practicable. The Corps must also evaluate the consistency of its decisions to existing land use plans and authorized purposes of the GPO. This Environmental Assessment (EA) documents the proposed Federal action, alternative actions considered, expected impacts of those actions, the final decision, and compliance with environmental laws and regulations.

The primary preparation and compilation of this EA and related environmental compliance has been completed by Kleinfelder / Buys and Associates, Inc. (KLF/Buys), Denver, Colorado for Newfield under the direction and supervision of the Corps. This EA will be adopted as a Corps document.

## 2.0 LOCATION

The proposed project is in McKenzie County, North Dakota. Two wells are proposed to be drilled adjacent to each other on one well pad in the NW¼ of the NE¼ of Section 3, Township (T) 153 North (N), Range (R) 96 West (W), which is about 0.06 miles south of Lake Sakakawea in the Charleson Oil Field. An access road from an existing oil and gas road is proposed to connect to the eastern edge of the well pad, running in a southeasterly direction for a length of about 208 feet (0.04 miles) through the NW¼ of the NE¼ of Section 3, T153N, R96W (**Appendix A** and **Appendix B**).

## 3.0 PURPOSE AND NEED

The decision of whether to approve/permit the proposed project is a Federal action by the Corps requiring compliance with NEPA, as amended, the Council on Environmental Quality's (CEQ) regulations for implementing NEPA (40 CFR 1500-1508), the Corps' regulations for implementing NEPA (ER 200-2-2), and other applicable environmental laws and regulations. This EA serves to document the proposed

Federal action, alternative actions considered, and the expected impacts of those actions. The purpose of this EA is to ensure the proposed project is consistent with existing land use plans and authorized purposes, the environmental consequences of the proposal are considered, that environmental and project information is available to decision makers and stakeholders, and to develop enough information to determine whether or not to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

The applicant's purpose for the proposal is to develop the mineral resources on Federal lease NDM-95176, consistent with existing Federal lease rights. The proposed project is needed to determine the economic viability of mineral resources within these leases, and if the wells are productive, to increase the development of oil and gas resources for commercial marketing to the public. Newfield's company strategy is to maximize operations at each well bore drilled in order to minimize surface disturbance and monetary costs. It is Newfield's policy to minimize adverse environmental impacts, mitigate unavoidable impacts, and comply with all applicable environmental laws and regulations.

## **4.0 PROPOSED ACTION AND ALTERNATIVES**

### **4.1 Alternatives Not Considered for Further Analysis**

No alternative proposals that were not analyzed in more detail were considered for this project. Seismic exploration and subsequent drilling does not aid in Bakken lateral drilling because the minerals in the target formation are proven. An alternative location for the proposed well pad and access road was considered in the SE $\frac{1}{4}$ SE $\frac{1}{4}$  of Section 3, T153N, R96W. However, this location was dismissed to avoid impacts to butterfly habitat and eligible cultural sites present at that location.

### **4.2 Alternatives Carried Forward for Further Analysis**

#### **4.2.1 Alternative 1 – No Action (Deny Access, Lease, Permits)**

Under the No Action alternative, the Corps would not approve the proposed project or associated permits. Current land use practices would continue at the proposed project location. Selection of this alternative would not preclude submittal of future proposals in NDM-95176 on a case-by-case basis.

#### **4.2.2 Alternative 2 – Approve Applicant's Proposal**

Under Alternative 2, the Corps would approve the proposed project as described below. Newfield is proposing to drill two exploratory oil and gas wells simultaneously from one well pad located on Corps-owned and administered land in McKenzie County, North Dakota. Newfield plans to drill the first well, set the surface casing, drill the second well, set the surface casing, go back to the first well and drill the long string, and so forth. The well names and legal location for the well pad are outlined in **Table 4.1**. All construction activities would follow lease stipulations, the Application for Permit to Drill (APD), and guidelines and standards identified in the *Surface Operating Standards for Oil and Gas Exploration and Development*, 4<sup>th</sup> edition, also known as the "Gold Book" (BLM/USFS 2007). All lease operations would be conducted in full compliance with applicable laws and regulations, including 43 CFR 3100, *Onshore Oil and Gas Orders 1, 2, 6 and 7*, approved plans of operations and any applicable Notices to Lessees.

**Table 4.1 Proposed Exploratory Well Names and Locations**

Well Name	Spot Call (¼ ¼) Surface Location	Section	Township	Range	Surface Hole Latitude	Surface Hole Longitude
<b>Pittsburgh Federal 153-96-3-2H</b>	NWNE	3	153N	96W	48°06'36.26" N	103°00'32.29" W
<b>Pittsburgh Federal 153-96-3-3H</b>	NWNE	3	153N	96W	48°06'36.26" N	103°00'33.40" W

#### 4.2.2.1 Field Camps

Long-term residential camps are not proposed. Self-contained trailers may house a few key personnel during drilling and completion operations, but such arrangements would be minimal. Construction and drilling personnel would typically commute to the project site. All debris and waste materials would be contained in a portable dumpster or trash cage. Upon completion of operations or as needed, the accumulated debris and waste materials would be removed from the site and disposed of at a State-approved waste disposal site. Sewage waste would be collected in portable chemical toilets, temporarily contained in either double-walled holding tanks or within a secondary containment system capable of holding 110 percent of the waste tank capacity. Toilet holding tanks would be regularly pumped and the contents transported to a State-approved wastewater treatment facility in accordance with applicable rules and regulations regarding sewage treatment and disposal. No burning or burying of trash would be allowed.

#### 4.2.2.2 Proposed Access Road

The primary access route to the action area would be from Highway 23 exiting at Keene, North Dakota. Directions to the action area are as follows:

- From Keene, North Dakota, travel in a northerly direction for approximately 12.3 miles to McKenzie County Road 2 (NFSR 869).
- Turn westerly for 5.0 miles to the existing XTO White Federal 34X-34 access road.
- Turn right to travel in a northerly direction for 0.8 miles to the proposed location.

Approximately 208 feet (0.04 miles) of new access/lease road would be constructed to access the well pad. The road would be constructed within a 40-foot-wide corridor, with a final running surface of up to 16 feet. The total initial disturbance area on Corps land for the proposed access road would be 0.19 acres; with a total residual disturbance area of 0.08 acres after interim reclamation is conducted. The existing XTO White Federal 34X-34 access road would be used to minimize new surface disturbance and upgrades to those roads would occur on an as-needed basis to facilitate access to each drilling location. The access road would be maintained in good repair during all drilling, completion, and production operations. Newfield would enter into a formal road maintenance agreement with XTO and the USFS prior to initiating construction.

The access road would be built or upgraded to accommodate drilling and completion vehicles/equipment in a safe manner. Design, construction, and maintenance would follow the standards outlined in the Gold Book (BLM/USFS 2007) and any Corps' Conditions of Approval (COAs) (see **Appendix C**). The proposed access road route spurs off of an existing two-track road and follows natural topographic contours. A maximum grade of 10 percent would be maintained and any additional drainage structures, where necessary, would be incorporated to prevent soil erosion and accommodate all-weather traffic. In

addition, to further prevent soil erosion, general erosion control and prevention techniques would be utilized in a timely manner and as needed. The proposed access road will be graveled with a minimum of six inches of 2-inch minus pit run gravel or crushed gravel prior to bringing production equipment onto the location. The addition of gravel to the new road would be minimized so that reclamation would be simplified should the well prove unproductive. All construction materials would be obtained from approved, private sources off Corps lands, would be certified weed-free, and would not contain any erionite. No materials would be removed from Corps lands without prior approval.

No approaches would be constructed along the access road. No vehicle traffic would be allowed off the established access road. In general, vehicle traffic would be minimized to the extent possible through strategic planning of operations activities. Fresh water would be used as needed to suppress and control dust.

Access road construction would typically require a D6 or larger crawler tractor, a D12 or larger motor grader, a Class 12R or larger track hoe, a mid-sized backhoe, two to four 10-yard dump trucks, and possibly a Class 988 loader. The road would be constructed using a crawler tractor or trackhoe to windrow the vegetation to one side, remove topsoil to the opposing side, and rough in the roadway. This would be followed by a grader or bulldozer to establish borrow ditches and crown the road surface. All construction equipment would be either pressure-washed or air-blasted prior to moving onto and off of Corps lands.

#### **4.2.2.3 Well Pad**

Under the Applicant's Proposal, a new well pad would be constructed. The proposed location for the well pad is illustrated in **Figures 1 and 2**, and the attached plat diagrams (see **Appendix A** and **Appendix B**). Construction of the well pad would involve the use of heavy equipment, such as a crawler tractor, motor grader, track hoe, backhoe, dump truck, and possibly a loader. As previously stated, all construction equipment would be either pressure-washed or air-blasted prior to moving onto Corps-owned and administered lands. All construction materials would be obtained from approved, private sources off Corps lands, and would be certified weed-free. The well pad would take five to seven days to construct.

With associated cut and fill slopes, berms and soil storage areas, the proposed well pad would occupy about 5.62 acres. Assuming interim reclamation success, long-term surface disturbance of the well pad would be reduced to approximately 3.57 acres. The well pad would be constructed from the native sand/soil/rock materials and leveled by balancing cut and fill areas with the finished well pad, lined, and would be graded to ensure positive water drainage away from the site. Drainage of pad runoff would be collected in an impervious lined catch trench. At any time the accumulated water exceeds  $\frac{3}{4}$  of the capacity of the trench it would be removed from the site and properly disposed of off Corps managed lands at a state approved disposal facilities. In addition, general erosion control and prevention techniques that would be utilized as needed for the well pad include: cut slopes of  $\frac{3}{4}$ :1 to 2:1 horizontal to vertical ratio; fill slopes with 1  $\frac{1}{2}$ :1 to 2:1 horizontal to vertical ratio; compaction of fill slopes to minimize subsidence or slope failure; directing runoff away from cut and fill slopes using steel containment berms, diversion ditches, or waterbars; mulching exposed soils; use of physical and biotechnical slope stabilization and sediment control structures; and prompt revegetation (BLM 2007, USFS 2007).

All drilling operations would use a closed loop mud and fluid system. Therefore, a reserve pit would not be necessary for the drilling of the proposed wells. During construction and drilling phases, equipment may be powered by fossil fuels. During the production phase, heater treaters and other Corps approved equipment may be powered by fossil fuels. All other equipment, such as pump units powered by fossil-fueled power sources would not be permitted. Prior to the placement of the drill rig on the well pad, the entire location would be fenced in order to protect both wildlife and livestock. A cattle guard would be installed where the fence crosses the proposed access road. Fencing would be installed according to the



Gold Book standards (BLM/USFS 2007) and the Corps' COAs and the integrity of the fence would be maintained for the life of the project. (see **Appendix C** and **Appendix D**). Warning signs identifying hazards and authorized personnel would be placed on the fence at critical locations such as at the cattle guards or at the access road entrance.

#### **4.2.2.4 Drilling, Casing and Cementing**

Drilling operations would require about 25 days to reach the target depth. For the first 1,400 feet of hole drilled, a fresh-water based mud system with no additives would be used to minimize contaminant concerns for surrounding groundwater aquifers. Water would be obtained from a commercial source for this drilling stage, using a total of about 10,000 barrels (420,000 gallons) per well. Surface casing would be set to 1,321 feet and cemented back to the surface during drilling per North Dakota Industrial Commission (NDIC) rules (**Appendix E**). This depth is 50 feet below the base of the Fox Hills Formation, also per NDIC rules, isolating all near surface freshwater aquifers in the project area. (NDIC §43-02-03-21)

After setting and cementing the surface casing, an oil-based mud (OBM) system (about 80 percent diesel fuel and 20 percent salt water) would be used to drill the remainder of the vertical hole and salt water would be used to drill the horizontal hole. About 60,480 gallons of diesel fuel and 15,120 gallons of salt water would be used for these stages. The intermediate casing would also be cemented from the target Bakken Formation at 10,434 feet depth at the end of the vertical/horizontal curve, through the curve, and up to 3,637 feet depth for both the Pittsburgh Federal #153-96-3-2H and the Pittsburgh Federal #153-96-3-3H (**Appendix E**). Drilling fluids would be contained in steel tanks placed on plastic/vinyl liners, then collected during drilling by centrifuging returns to separate the cuttings from fluids, a process that retrieves over 95 percent of the drilling fluids. These fluids would be recycled back into the steel tanks for continual re-use during the drilling process. Upon completion of drilling operations at each location, oil-based fluids would be collected to the extent possible (usually over 95 percent) for use elsewhere. All non-recyclable fluids, including fresh water, and cuttings generated must be hauled off-site and disposed of at a State-approved facility.

##### ***4.2.2.4.1 Construction Details for Individuals Wells***

#### **Pittsburgh Federal #153-96-3-2H**

The proposed Pittsburgh Federal #153-96-3-2H would be vertical until about 10,123 feet, then curve until roughly horizontal at about 10,434 feet. The completed drill string will total about 15,386 feet at a true vertical depth (TVD) of about 10,123, including an approximately 4,952 foot lateral reach in the Bakken Formation. The drilling target is about 250 feet from the south section line (FSL) and 650 feet from the east section line (FEL) (S ½ of the S ½) of Section 3.

#### **Pittsburgh Federal #153-96-3-3H**

The proposed Pittsburgh Federal #153-96-3-2H well would be vertical until about 10,123 feet, then curve until roughly horizontal at about 10,434 feet. The completed drill string will total about 14,901 feet at a TVD of about 10,434, including an approximately 4,467 foot lateral reach in the Bakken Formation. The drilling target is about 250 feet FSL and 2.640 feet FEL (S ½ of the S ½) of Section 3.

#### **4.2.2.5 Completion and Evaluation**

After the wells have been drilled and cased simultaneously, a completion (work-over) unit would be moved onto the site. For wells of the depth proposed, approximately 14 to 28 days are usually needed to clean out the well bore, pressure test the casing, perforate and fracture the horizontal portion of the hole, and run production tubing for commercial production. The typical procedure for fracturing is to pump downhole a mixture of sand and a transport medium (e.g., water and/or nitrogen) under extreme pressure. The exact contents of the fracturing mixture will not be known until approximately one week prior to

hydrofracturing the formation. However, Newfield has identified six diesel fluids that they would not allow their completion contractors to use the fracturing mixture. Following the completion of the well, a report would be issued that would detail the exact contents of the fracturing mixture. After fracturing, the well is typically flowed back to the surface to recover fracture fluids and remove excess sand. Fluids utilized in the completion procedure would be captured in tanks and disposed of at a State-approved facility.

#### **4.2.2.6 Commercial Production**

If commercial production is supported from either of the proposed wells, additional equipment would be installed, including a pumping unit at the well head, a vertical heater/treater, and oil and produced storage water tanks. These facilities would be located as close as possible to each other to allow the maximum amount of interim reclamation of the well pad. Tanks would be placed on the cut portion of the well pad, and have a secondary metal panel type containment sized to hold a minimum of 110 percent of the volume of the largest tank. During the production phase, well site equipment will be electrically driven. Thus, well site equipment will not be powered by any fossil-fueled power sources. All production facilities and equipment would have proper hatches, seals, and valves and would be inspected and maintained on a regular schedule. Any open vessels on-site would be enclosed with wire mesh or netting. All permanent above ground production facilities, equipment, and accessories will be painted a flat, earth tone color that blends with surrounding environment within six months of well completion, unless approved otherwise by the Corps. Color selection will be determined by the Corps and will be painted using an approved Corps paint scheme.

Produced oil would be collected in tanks installed on location and periodically trucked to an existing oil terminal until a connection to an existing pipeline is approved and installed. Any produced water would be captured in tanks and periodically trucked to an approved disposal site. The frequency of trucking activities for both oil and produced water would depend upon volumes and rates of production. The proposed wells are also expected to produce some natural gas. For safety reasons and to avoid potential impacts to soils from the use of flare pits, natural gas may be temporarily flared until a pipeline is installed according to applicable NDIC regulations to gather and transport the gas product. The typical height of a vertical flare unit is approximately 15 to 20 feet above ground surface. The height of the vertical flare unit is dependent on the volume of gas (see Visual Resources, **Section 4.2.2.9**). The subsequent pipeline would parallel the proposed access road and tie into an existing Bear Paw Energy pipeline located at the existing road intersection (see **Section 4.2.2.7**).

The duration of production operations cannot be reliably predicted, but generally the average life of a productive well in this area is five to twenty years.

#### **4.2.2.7 Pipelines and Electrical Service**

Under the Applicant's Proposal, approximately 208 feet of electrical services related to the production phase of the wells would be buried along the route of the proposed access road.

Approximately 208 feet of buried 6-inch outer diameter (OD) oil and 8-inch OD gas gathering pipelines would be implemented within the same disturbance corridor as the utility line ROW if either of the proposed wells produces in commercial quantities.

Installation of the proposed pipelines and utility line would generally require expansion of the disturbance corridor along the proposed access road. This would initially involve widening the disturbance corridor along the proposed access road by approximately 30 feet in order to accommodate the proposed oil and gas gathering pipelines and utility line. Following installation approximately 15 feet of the pipeline ROW width could be reclaimed, leaving a 15-foot width for the long-term ROW. The total initial disturbance

area on Corps land for the proposed pipeline/utility ROW would be 0.14 acres, with a total residual disturbance area of 0.07 acres after interim reclamation is conducted.

The pipeline ROW would tie into the existing Bear Paw Energy pipeline at the existing road intersection. Each pipeline would be pressure tested with air to locate any leaks for 100 percent Maximum Allowable Working Pressure (MAWP), and would be constructed to applicable American Petroleum Institute (API)/industry standards. The pipelines would be constructed in four to six days.

Any gathering pipelines buried under waters of the U.S. would require a U.S. Army Corps of Engineers permit (typically Nationwide Permit #12). However, the proposed pipelines do not cross any waters of the U.S.

#### **4.2.2.8 Reclamation**

Construction of the well pad, access road, and pipeline/utility corridor would initially disturb approximately 5.95 acres. Interim reclamation measures to be accomplished within the first year following drilling and completion of both wells include reduction of the cut and fill slopes, redistribution of stockpiled topsoil, mulching exposed soils, and reseeding of disturbed areas. Interim reclamation would reduce the total amount of disturbance to approximately 3.72 acres of long-term disturbance. The unused area of the well pad and pipeline/utility corridor would be re-contoured, covered with top soil, and reseeded/mulched. Rat and mouse holes would be filled and compacted from bottom to top immediately following the release of the drilling rig. Assuming interim reclamation success, long-term surface disturbance of the well pad would be reduced to approximately 3.57 acres, and the long-term surface disturbance of the pipeline/utility corridor would be reduced to approximately 0.07 acres. The access road would be covered with stockpiled topsoil from the road running surface to the edge of cuts and fills and reseeded/mulched to reduce the long-term access-related disturbance to approximately 16 feet wide and about 0.8 acres in size. Erosion control measures would be installed as necessary per Newfield's field-wide Storm Water Management Plan (SWMP) (**Appendix F**) and their site-specific SWMP, which will be prepared prior to construction activities.

For interim reclamation, seeding with Corps-approved seed mixtures, and/or mulching exposed soils with certified weed-free mulch would be done completed during the next closest growing season (i.e., spring or fall) following the completion of all construction, drilling, and completion activities.

Final reclamation would occur either in the short term if the proposed wells are commercially unproductive, or later upon final abandonment of commercial operations. All disturbed areas would be reclaimed. All facilities would be removed, well bores would be plugged with cement and dry hole markers would be set. Access roads and the well pad would be leveled or backfilled as necessary, re-contoured to approximate original contours, evenly spread with stored topsoil, scarified, and reseeded/mulched.

For final reclamation, seeding with Corps-approved seed mixtures and/or mulching exposed soils with certified weed-free mulch would be completed during the closest growing season (i.e., spring or fall) following plugging and abandonment activities.

Seeding tags would be provided to the Corps for verification. Seed mixtures would consist of native species only. All construction equipment would be either pressure-washed or air-blasted prior to moving onto Corps lands. All reclamation materials would be obtained from approved, private sources off Corps lands, and would be certified weed-free.

#### **4.2.2.9 Applicant-Committed Environmental Protection Measures**

In addition to the environmental protection measures required by applicable regulatory authorities, the following applicant-committed environmental mitigation measures would be applied to all activities on



Federal lands within the project area. Implementation of these measures would be incorporated as Conditions of Approval (COAs), which authorizes the Corps to enforce these measures to help avoid or minimize impacts to the environment.

#### **Agricultural / Rangeland Management**

- Newfield would repair or replace to current Corps standards any fences, cattle guards, gates, drift fences, and natural barriers that are damaged as a result of their proposed oil exploration.

#### **Air Quality**

- Newfield would use water or other approved dust suppressants at the well pad and along roads, as determined appropriate by the Corps.
- Newfield would not allow any open burning or burying of garbage or refuse at the well site.

#### **Cultural/Historical Resources**

- Before construction begins Newfield personnel would inform Newfield employees, contractors and subcontractors about relevant Federal regulations intended to protect archaeological and cultural resources. This orientation would include training on cultural resource management. All personnel would be informed that collecting artifacts is a violation of Federal law and that employees engaged in this activity would be subject to disciplinary action. If cultural resource law violations are discovered, the offending employee would be subject to disciplinary action by Newfield and the violations would be reported to the appropriate Federal and State agencies, which may pursue prosecution.
- If cultural resources are uncovered during surface-disturbing activities, Newfield would suspend operations at the site and immediately contact the Corps, who would arrange for a determination of eligibility in consultation with the State Historic Preservation Office (SHPO), and, if necessary, recommend a recovery or avoidance plan.

#### **Health and Safety/Hazardous Materials**

- Newfield would utilize portable sanitation facilities at the drill site, place dumpsters and/or trash cages at the site to collect and store garbage and refuse, and ensure that all refuse and garbage is transported to licensed waste disposal sites.

#### **Migratory Birds and Raptors**

In accordance with the United States Forest Service (USFS) Dakota Prairie Grassland's Land and Resource Management Plan (2001), the following measures would be implemented to further minimize potential impacts to migratory birds/raptors:

- Prior to any surface-disturbing activities between February 1 and July 15, a Corps approved contractor would survey all areas within 0.5 mile of proposed surface disturbance for the presence of raptor nests. If active raptor nests are found, construction would not occur during the nesting season for that species within the species-specific buffer, as determined by the United States Fish and Wildlife Service (USFWS) and the North Dakota Game and Fish Department (NDGFD).
- Construction would be scheduled after July 15 to avoid the breeding and nesting season of migratory birds and other wildlife.
- Half-mile buffers would be maintained between the project location and any active golden and bald eagle nests.

- If whooping cranes are sighted within one mile of the project area, Newfield would suspend operations at the site and immediately contact the Corps, who would consult with the USFWS. All work would cease within the project area until the whooping cranes leave the area, and the USFWS has determined, in writing, that work could continue without impacting the whooping cranes.

#### **Paleontological Resources**

- If fossils are encountered during excavation, construction would be suspended, and the Corps would be notified. Construction would not resume until the fossils are assessed by the Corps, and appropriate mitigation measures are developed and implemented.

#### **Soils**

- During construction activities, topsoil would be temporarily stockpiled and either seeded/mulched or covered with a breathable material within 10 days after ground removal to reduce erosion until interim reclamation is initiated. In addition, BMPs, such as the use of berms, waterbars, waddles, haybales, etc. would be implemented to control soil erosion, control any spills, and prevent storm water runoff (see **Appendices F and G**). Interim reclamation would commence as soon as operationally feasible within the closest growing season (i.e., spring or fall) following drilling and completion activities. On reclaimed areas, topsoil depths would be distributed evenly unless conditions warrant a varying depth. Minor variations in topography will be taken into consideration in order to blend in with the surrounding topography.
- Areas used for spoil storage would be stripped of topsoil before spoil placement.
- Appropriate erosion control and revegetation measures would be employed as needed. If any portion of the proposed well pad or access road includes areas with unstable soils where seeding and mulching alone may not adequately control erosion, grading would be used to minimize slopes, and water bars would be installed on disturbed slopes. Water bars would be constructed at the following intervals: 0-2% slope (200 feet), 2-4% slope (100 feet), 4-5% slope (75 feet), and 5%+ (50 feet). Erosion control efforts would be monitored by Newfield and necessary modifications made to control erosion.
- Soils compacted during construction would be ripped and tilled as necessary prior to reseeding. Cut and fill sections on all disturbed areas would be revegetated with plant species approved by the Corps.
- If ground frost prevents the segregation and removal of the topsoil material from the less desirable subsoil material, cross ripping to the depth of the topsoil material would be implemented.

#### **Vegetation**

- Removal and disturbance of vegetation would be kept to a minimum through construction site management.

#### **Visual Resources**

- The U.S. Army Corps of Engineers will adopt and use the BLM Visual Resource Management (VRM) classification and accompanying development restrictions. The VRM contains design techniques to reduce impact of development on the resource.
- Lake Sakakawea will be managed and maintained as a VRM II. The objective of a VRM II classification is to retain the existing character of the landscape, with the level of change being

low to the characteristics of the landscape. Development plans that degrade Lake Sakakawea to a lower classification would not be permitted. A more detailed description of VRM requirements can be found by accessing the BLM Visual Resource Management website at: <http://www.blm.gov/nstc/VRM/>

- The BLM VRM Standard requires camouflage paint. All structures need to be painted using this scheme unless the desired color is for a safety purpose. The GPO would select the camouflage pattern and/or color(s). Every tank, separator, wellhead, and other associated pad facilities would be painted at least once every five years. Newfield would submit a schedule that would accompany the APD.
- If electrical lighting is needed, Newfield would use spot lights with appropriate light shrouding. Non-focused lighting, such as that provided by metal halides, would not be used.

The potential visual impact that could result from the temporary use of a vertical flare stack would be reduced with topographic screening through the use of earthen berms. If determined necessary by the Corps, Newfield would employ the use of a combustor on the flare stack. While a combustor would add to the approximate 15 to 20-foot height of the flare stack by an additional 6 to 12 feet, the combustor would eliminate visible flames from the stack, thereby reducing visibility of stack activity on the lake.

#### **Water Resources**

- Newfield would inform their employees, contractors and subcontractors of the potential impacts that could result from accidental spills, as well as the appropriate actions to take if a spill does occur. A regional Spill Prevention, Control, and Countermeasure (SPCC) plan is located in **Appendix G**. A site-specific SPCC plan would be completed and implemented by Newfield following construction and during the seven-day inspection schedule. A field-wide SWMP is included in **Appendix F**. A site-specific SWMP would be completed by Newfield prior to construction activities.
- Newly constructed gas and water pipelines would be pressure tested to evaluate structural soundness and reduce the potential for leaks.
- Gas and water pipelines would be bored to avoid impacts to Corps jurisdictional drainages.

#### **Wildlife**

- To minimize wildlife-vehicle collisions, Newfield would advise employees and contractors regarding appropriate speed limits in the vicinity of project area.
- Newfield employees and contractors would be educated about anti-poaching laws. If wildlife law violations are discovered, the offending employee would be subject to disciplinary action by Newfield and the violations would be reported to the appropriate Federal and State agencies, which may pursue prosecution.

### **4.2.3 Alternative 3 – Approve Applicant’s Proposal with Additional Mitigation Measures**

Alternative 3 consists of the applicant’s proposal (Alternative 2), with enhanced mitigation measures developed by participating agencies and stakeholders that would provide additional natural resource protection to native plants and animals in the vicinity of the project. The additional mitigation measures are as follows.

#### **4.2.3.1 Catch Trench Construction**

A catch trench lined with an impervious liner would be constructed on the down slope end of the well pad to contain any water drainage from the proposed site. All water retained in the catch trench would be pumped and removed from the site or left to evaporate. No pumping of water from the catch trench onto Corps lands would be allowed at any time.

#### **4.2.3.2 Pre-Construction Noxious Weed Control**

During the growing season, pre and post construction noxious weed surveys would be conducted throughout the project area. Integrated weed management control measures would be completed in accordance with the United States Department of Agriculture (USDA) and the State of North Dakota's Century Code, Noxious Weed Control (Chapter 63-01.1).

#### **4.2.3.3 Additional Sensitive Wildlife Resources Mitigation**

USFS Dakota Prairie Grassland Land and Resource Management Plan (USDA 2001) stipulations for oil and gas leases would be applied to activity on Corps lands, including no surface occupancy, timing limitations or seasonal restrictions, and controlled surface use for known occurrences of wildlife species identified in the management plan that are within specified radii of the proposed project.

#### **4.2.3.4 Additional Mitigation Measures Considered but Dismissed**

Additional mitigation measures were considered but dismissed as follows:

##### ***Additional Soil and Vegetation Resources Mitigation***

The use of wooden mats under drill rigs, completion rigs, and production facilities was considered as a mitigation measure to minimize disturbance to soil and vegetation and accelerate reclamation. This technique involves placing constructed mats over the native ground surface to reduce or eliminate the need for the excavation and construction necessary with the well pad. However, this technique was dismissed due to topographic restrictions (slope greater than three percent) and the need to construct the well pad to safely support the drill rig, completion rigs, and production facilities. Furthermore, the weight of the mats, equipment, and production facilities, while dispersed by the area covered by the mats, may compact the underlying soils. This could lead to reduced infiltration of water into the soil and permeability of water through the soil, reduced diffusion of oxygen, carbon dioxide and other gases in and out of soils, reduced nutrient cycling and the availability of essential plant nutrients, reduced plant root penetration, reduced plant growth and production, and increased soil erosion and sedimentation. The weight of the mats and operational equipment may also be an impact to underlying vegetation due to the lack of sunlight for photosynthesis and structural damage to the underlying grasses (BLM 2005).

##### ***Additional Visual Resource Mitigation***

A vertical flare stack is proposed to temporarily flare all natural gas until a pipeline is installed to gather and transport the gas product. Other configurations of the flare unit, such as a ground level flare stack and a flare pit, were considered as a mitigation option to the potential visual impact of a vertical flare stack. Ground level flares locate the flare tip and combustion zone at ground level. The consideration of a ground level flare mitigation option was dismissed because a ground level flare has poor dispersion of combustion product, which could result in potential impacts to air quality (KLM 2007). A flare pit is an earthen containment area in which waste gases and liquids are combusted. The consideration of a flare pit mitigation option was dismissed because flare pits are a proven source of soil and groundwater contamination (University of Saskatchewan 2006).

## **5.0 AFFECTED ENVIRONMENT**

### **5.1 Geology/Physiography**

The project area is located within the Missouri Plateau region of the Great Plains physiographic province just south of Lake Sakakawea. The Missouri Plateau is a glaciated landscape characterized by low relief and gentle slopes interrupted by buttes and ridges. Thin glacial drift covers the upper portions of the pre-glacial topography and thicken in valley fill areas. Scattered boulders on the upper slopes of buttes indicate that these were ice-covered during the Pleistocene.

Elevations in the area range from about 1,825 feet at Lake Sakakawea to over 2,820 feet at Blue Buttes to the southwest of the project area. Pool elevations of Lake Sakakawea fluctuate seasonally in the 1,825 to 1,854 feet range (Carlson 1985). The proposed well pad and access road would be situated on nearly level terrain to the south of Lake Sakakawea at an elevation of about 2,100 feet.

McKenzie County is near the center of the Williston Basin, an intracratonic sedimentary basin whose center is near Williston, North Dakota. The sedimentary rocks of the Williston Basin are about 16,000 feet thick and were deposited during the Paleozoic, Mesozoic, and Cenozoic eras. The proposed well pad and access road lie on the Bullion Creek Formation of Paleocene age. The Bullion Creek Formation consists of yellow-brown silt, sand, and clay with abundant lignite layers, is about 600 feet thick, and is representative of river, lake, and swamp deposits (Clayton 1980). The Bullion Creek Formation is underlain by older Paleocene rocks and the Cretaceous Fox Hills Sandstone. Rocks older than the Fox Hills Sandstone, including the Mississippian and Devonian Bakken and Three Forks formations, are the targets for oil and gas production.

The climate of McKenzie County is cool and semiarid to subhumid and continental. The area is usually quite warm in summer with frequent spells of hot weather and occasional cool days. It is very cold in winter, when arctic air frequently surges over the area. Most precipitation falls in late spring and early summer. Mean temperatures fluctuate between -30° to 13° F in January and 72° in July to 88° in August (USDA 2006). Annual precipitation averages about 15.9 inches. Thunderstorms are common in June, July, and August (Croft 1985).

### **5.2 Climate/Greenhouse Gases**

Gases that trap heat in the atmosphere are often called greenhouse gases (GHG). The Environmental Protection Agency (EPA) has defined the principal greenhouse gases that enter the atmosphere because of human activities as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and fluorinated gases.

Many elements of human society and the environment are sensitive to climate variability and change. Human health, agriculture, natural ecosystems, coastal areas, and heating and cooling requirements are examples of climate-sensitive systems.

Rising average temperatures are already affecting the environment. Some observed changes include shrinking of glaciers, thawing of permafrost, later freezing and earlier break-up of ice on rivers and lakes, lengthening of growing seasons, shifts in plant and animal ranges and earlier flowering of trees (National Academy of Sciences 2007).

Global temperatures are expected to continue to rise as human activities continue to add carbon dioxide, methane, nitrous oxide, and other greenhouse (or heat-trapping) gases to the atmosphere. Most of the United States is expected to experience an increase in average temperature (National Academy of



Sciences 2007). Precipitation changes, which are also very important to consider when assessing climate change effects, are more difficult to predict. Thus, rainfall projections are unavailable for specific regions.

### 5.3 Soils

The development of soils is governed by many factors, including climatic conditions (e.g., the amount and timing of precipitation, temperature, and wind), the parent material, topographic position (e.g., slope, elevation, and aspect), geomorphic processes, and vegetation type and cover. Soils in the project area are developed on the side slopes of draws, ridges, and mesa tops.

**Figure 3** shows the soil units near the proposed well pad and access road. The well pad and access road would be located on gentle slopes of three to six percent on a single soil map unit, the Williams-Zahl loams (NRCS 2011). The Williams soils cover about 49 percent of the map unit and the Zahl soils cover 27 percent of the map unit, with 5 other soil types comprising the balance. Both of the dominant soil types consist of loam and clay loam and are deep, well drained, and have a high water capacity. This soil unit has not been identified as prime farmland soils (USDA 2006).

For evaluation of potential environmental impacts to soils, the key attributes are their erosion potential and ease of reclamation after soil disturbance. Soil mapping conducted by the Natural Resources Conservation Service (NRCS) under the United States Department of Agriculture (USDA) typically provides information about each soil type within the mapped area that can be used to evaluate the erosion potential and reclamation potential of each soil unit. Erosion potential can vary widely among soil units within a given area, and is generally dependent on the particle size distribution of the soil, the slopes on which it is found, and the amount and type of vegetative cover. Erosion hazards may become a critical issue when protective vegetation is removed during and following activities such as access road and well pad construction. The NRCS typically rates soil units according to their water erosion potential ( $K_w$ ). The erosion potential indicates the general susceptibility of a soil to sheet and rill erosion. The value of  $K_w$  ranges from 0.02 to 0.59. The higher the  $K_w$  value of a soil type, the more susceptible the soil type is to sheet and rill erosion. The water erosion potential  $K_w$  is 0.28 for the Williams-Zahl loams, which indicates moderate erosion potential.

Reclamation potential is dependent on the soil structure and texture, clay content, pH conditions, and soil salinity, among other factors. Excessive salinity (salt content), acidity, or alkalinity can inhibit the growth of desirable vegetation. The Williams-Zahl loams are considered to be non-saline with low to moderate sodium adsorption ratio (SAR) of one to five. Neither soil type is prone to flooding or ponding.

### 5.4 Water Resources

#### 5.4.1 Surface Water

**Figure 2**, the general vicinity map, shows the surface water resources near the proposed well pad and access road. The project area is within the Red Mike Hill sub-watershed of the Lake Sakakawea basin. Surface runoff from the well pad location would flow to the north to deep, woody draws which flow into Lake Sakakawea. There are no perennial streams in the project area. No wild or scenic rivers or river reaches have been designated or proposed in the State of North Dakota (USFWS 2009).

#### 5.4.2 Groundwater

Groundwater near the project area is contained in bedrock aquifers of Late Cretaceous and Tertiary age and in unconsolidated deposits of sand and gravel of Quaternary age along major rivers and streams (Croft 1985). The Tongue River aquifer system underlies all of McKenzie County at depths of about 140 to 500 feet and consists of sandstone, siltstone, claystone, and lignite. Wells completed in this aquifer yield about

25 gallons per minute (gpm) of soft, sodium bicarbonate type water with a median total dissolved solids (TDS) concentration of 1,830 mg/L.

The Ludlow aquifer system underlies all of McKenzie County at depths of more than 500 feet in the Fort Union Formation. The Ludlow aquifer system also consists of sandstone, siltstone, claystone, and lignite and yields as much as 25 gpm to wells. Groundwater in the Ludlow aquifer system is a soft, sodium bicarbonate type water with a median TDS concentration of 1,750 mg/L. The water is not suitable for irrigation or municipal use. It is, however, suitable for most domestic and livestock uses.

Deeper bedrock aquifers of Late Cretaceous and Tertiary age are contained in the Fox Hills and Hell Creek formations, and are used as a water source for livestock and domestic supplies. These aquifers are generally located at depths of 1,100 to 1,800 feet. Groundwater yielded from these aquifers has a median TDS concentration of about 1,325 mg/L. Rocks older than Late Cretaceous age extend to about 15,000 feet (4,572 meters) and generally contain brackish water that is unsuitable for most purposes.

Groundwater obtained from aquifers in unconsolidated sand and gravel of Quaternary age is suitable for domestic, livestock, municipal, industrial, and irrigation uses. Six aquifers, consisting of about 50 to 176 feet of unconsolidated sand and gravel of Quaternary age, occur in McKenzie County. These sand and gravel aquifers yield between 100 and 500 gpm to wells. Groundwater from these aquifers generally is a sodium bicarbonate type with median TDS concentrations ranging from 1,100 to 2,330 mg/L. The closest unconsolidated aquifer to the project area is along Tobacco Garden Creek approximately four miles to the west (Croft 1985).

Review of North Dakota State Water Commission (NDSWC) records show that one water well (153-096-03 BAB) is located within one mile of the project area. This well is used for stock watering (NDSWC 2009).

## **5.5 Wetlands/Riparian Habitat and Floodplains**

There are no wetlands or riparian habitat adjacent to the proposed well pad and access road. The two steep sided draws located to the southeast and southwest of the project area (see aerial imagery in **Figure 4**) are separated by existing Corps roads. The draw on the southeast side of project area contains an unnamed stream, which drains into Lake Sakakawea approximately 0.5 miles to the north.

## **5.6 Threatened, Endangered, and Species of Concern**

Five Federally endangered, one threatened, two candidate, and two monitored species are listed by the USFWS for McKenzie County. The endangered species include the black-footed ferret (*Mustela nigripes*), gray wolf (*Canis lupus*), interior least tern (*Sterna antillarum*), pallid sturgeon (*Scaphirhynchus albus*), and whooping crane (*Grus Americana*) (Schmoller, 2010) (see **Appendix H**). The Federally threatened species includes piping plover (*Charadrius melodus*). Candidate species include the Dakota skipper (*Hesperia dacotae*), and greater sage grouse (*Centrocercus urophasianus*). In addition, Sprague's pipit is now listed as a candidate species (Federal Register Vol. 75, No. 178, p. 56028), and there is also designated critical habitat for the piping plover within one mile of the action area (**Figure 5**) (Schmoller, 2010). The two monitored species include the bald eagle (*Haliaeetus leucocephalus*), and golden eagle (*Aquila chrysaetos*).

### **Black-footed Ferret**

Black-footed ferrets have been extirpated from the state, but were historically found in the southwest corner of the state. The black-footed ferret depends on prairie dogs (*Cynomys* spp.) for their food and burrows for shelter. No prairie dog populations were observed in the action area (Schmoller, 2010) and no black-footed ferrets have been reintroduced in this area.

### **Gray Wolf**

Gray wolves are not known to breed in North Dakota, and most observation reports come from the extreme northeast part of the state (Simmer, 2009). These animals most likely come from established populations in northern Minnesota and southern Manitoba (Schmoller, 2010). The proposed project does not have forested cover or a suitable prey base for this species, and there have been no sightings in the vicinity of the action area (USFWS, 2006) (Schmoller, 2010).

### **Interior Least Tern**

Interior least tern breeding areas in North Dakota constitute about 192 km of the length of the Missouri River from Garrison Dam to the mouth of the Cannonball River south of Bismarck (USFWS, 1990). While least tern habitat does not occur within the immediate vicinity of the well pad, they could migrate over the area to access habitats along Lake Sakakawea, which is 0.5 miles north of the proposed well pad.

### **Pallid Sturgeon**

The pallid sturgeon is known to occur in the Missouri and Yellowstone Rivers. The Missouri River (Lake Sakakawea) is 0.5 miles north of the action area. The Yellowstone River is 45 miles to the southwest of the action area. Reproduction of pallid sturgeon in the Missouri and Yellowstone Rivers has not been documented in 33 years (Krentz, 1997).

### **Whooping Cranes**

Whooping cranes breed and nest in wetland habitat in Wood-Buffalo National Park, Canada. Migration through North Dakota occurs during the spring and fall. Potential roosting/foraging habitat does not occur in the immediate action area (i.e., does not occur at the well pad or access road) (Schmoller, 2010). However, wetland roosting/foraging habitat does exist along the shore of Lake Sakakawea 0.5 miles north of the project location.

### **Piping Plover**

The proposed well pad and access road occurs in an upland grassland habitat with no suitable nesting or foraging habitats for the piping plover. However, critical habitat for the species (alkali wetlands and lakes) occurs along the Missouri River (Lake Sakakawea), which is 0.5 miles north of the action area.

### **Dakota Skipper**

Dakota skipper occurs in two types of habitat. The first is relatively flat and moist native bluestem prairie in which three species of wildflowers are usually present and in flower when Dakota skippers are in their adult (flight) stage- wood lily, harebell, and smooth camas (Schmoller, 2010). The second habitat type is upland prairie that is often on ridges and hillsides. Bluestem grasses and needle grasses dominate these habitats and three wildflowers are typically present in high quality sites that are suitable for Dakota skipper: pale purple and upright coneflowers and blanket flower (USFWS, 2002). The action area, in particular the steep slopes to the southwest and southeast of the proposed well site, support potential habitat for the Dakota skipper.

### **Greater Sage Grouse**

Greater sage grouse prefer big sagebrush (*Artemisia tridentata*) habitat, which does occur in McKenzie County. However, the closest population and known observations of greater sage grouse and known leks are located in the southwest corner of North Dakota, with the nearest territorial males observed in Billings County, which is 60 miles away. The bulk of greater sage grouse populations and known leks are in Bowman County, which is 130 miles away (Schmoller, 2010). The species has not been documented in the action area.

### **Sprague's Pipit**



Sprague's pipits are strongly tied to native prairie (land that has never been plowed) throughout their life cycle. It is one of the few bird species endemic to the North American prairie (Schmoller, 2010). The breeding range includes all of North Dakota, except for the eastern most counties: northern and central Montana east of the Rocky Mountains, northern portions of South Dakota, and northwestern Minnesota (USFWS, 2010). The action area is a mosaic of small patches of native mixed grass prairie along with reclaimed grasslands dominated by non-native species, and supports potential habitat for the species. The U.S. Forest Service has observed Sprague's pipits in the vicinity of the action area.

### Bald and Golden Eagles

Bald and golden eagles prefer large trees with sturdy horizontal branches for nesting and winter roosting, with a clear flight path to water (Schmoller, 2010). Wintering eagles concentrate at established roosting sites for the purpose of feeding and sheltering in close proximity to sufficient food sources. Such habitat does exist within the action area along the Missouri, which is 0.5 miles to the north of the proposed well pad. Large cottonwood (*Populus deltoides*), green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus Americana*) also occur in the wooded draws and creek bottoms adjacent to the well pad.

No bald eagles or bald eagle nest sites have been observed within the action area and there are no historical records of such (Schmoller, 2010). However, because the action area provides suitable nesting and roosting habitat in the draws adjacent to the proposed well pad, and because of its proximity to habitats along the lake, bald eagles have the potential to migrate through or over the project location.

The U.S. Forest Service Prairie Grasslands field office has a record of a golden eagle nest located approximately 1.5 miles southwest of the action area (Gary Foli, personal communication, 2011).

**Table 5.1 Federally Listed Species Known or Potentially Occurring in McKenzie County, North Dakota (USFWS 2011)**

Species	Status	Potential to Occur in the Project Area?
Whooping crane ( <i>Grus americana</i> )	Endangered	Yes, potential to migrate over Project Area to habitat on Lake Sakakawea
Interior least tern ( <i>Sterna antillarum</i> )	Endangered	Yes, potential to migrate over Project Area to habitat on Lake Sakakawea
Black-footed ferret ( <i>Mustela nigripes</i> )	Endangered	No, the black-footed ferret depends on prairie dogs for their food and burrows for shelter. No prairie dog populations were observed in the Project Area, and no black-footed ferrets have been reintroduced in the area.
Pallid sturgeon ( <i>Scaphirhynchus albus</i> )	Endangered	Yes, occurs in Lake Sakakawea
Gray wolf ( <i>Canis lupus</i> )	Endangered	No, there have been no sightings in the vicinity.
Piping plover ( <i>Charadrius melodus</i> )	Threatened	Yes, potential to migrate over Project Area to habitat on Lake Sakakawea
Greater sage grouse ( <i>Centrocercus urophasianus</i> )	Candidate	No, greater sage grouse prefer big sagebrush ( <i>Artemisia tridentata</i> ) habitat, which does occur in McKenzie County.
Dakota skipper ( <i>Hesperia dacotae</i> )	Candidate	Yes, the Project Area, in particular the steep slopes to the southwest and southeast of the Project Area, support potential habitat.
Sprague's pipit ( <i>Anthus spragueii</i> )	Candidate	Yes, the Project Area is a mosaic of small patches of native mixed grass

		prairie along with reclaimed grasslands dominated by non-native species, and supports potential habitat for the species. The U.S. Forest Service has observed Sprague's pipits in the vicinity of the Project Area.
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<sup>1</sup> may affect individuals or habitat, but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.

## 5.7 Vegetation and Invasive Species

Vegetation in the project area is mostly mixed grass prairie. The proposed access road and well pad are situated on tableland that is reclaimed grassland. Western wheatgrass (*Agropyron cristatum*) and smooth brome (*Bromus inermis*) are the dominant species. There are small patches of blue grama (*Bouteloua gracilis*), green needlegrass (*Stipa viridula*), needle-and-thread (*Stipa comata*) grassland associations and some western snowberry (*Symphoricarpos occidentalis*) (Schmoller 2010).

To the southwest and southeast of the proposed well site are two steep sided draws. One of these draws descends rapidly toward an unnamed, intermittent creek that empties into Lake Sakakawea, 0.5 mile to the north. The side slopes are dominated by little bluestem (*Andropogon scoparius*), prairie sandreed (*Calamovilfa longifolia*), cudweed sagewort (*Artemisia ludoviciana*), Canada anemone (*Anemone cylindrica*), dotted gayfeather (*Liatris punctata*), stiff sunflower (*Helianthus rigida*) and purple coneflower (*Echinacea angustifolia*). The ravines are dense wooded draws with green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), and chokecherry (*Prunus virginiana*) habitat. The walls of the ravine are nearly continuous, unvegetated badland outcrops (Schmoller 2010).

Of 12 species declared as noxious weeds under the North Dakota Century Code, Noxious Weed Control (Chapter 63-01.1), seven are known to occur in McKenzie County, including absinth wormwood, Canada thistle, leafy spurge, musk thistle, Russian knapweed, salt cedar, and spotted knapweed (Simmers 2009). McKenzie County has also *designated* four additional species within its jurisdiction, including black henbane (*Hyoscyamus niger*), common burdock (*Arctium minus*), yellow toadflax (*Linaria vulgaris*), and houndstongue (*Cynoglossum officinale*) (Simmer 2009).

While a formal weed inventory has not been conducted for the project area, two biological consulting firms conducted field assessments of the project area and the adjacent lands. Yellowfield Biological Surveys, LLC did not identify any State-listed noxious weeds in the vicinity of the project area. However, they did identify invasive species including dandelion (*Taraxacum officinale*), salsify (*Tragopogon dubius*), blue lettuce (*Lactuca oblongifolia*) and yarrow (*Achillea millefolium*) (Schmoller 2011).

Eight non-native species were identified in the vicinity of the project area (Simmers 2009). One of these, leafy spurge (*Euphorbia esula*), is a State-listed noxious weed. Observations of leafy spurge were noted as scattered individuals in a small area along the north-running portion of the existing road. Several other non-natives present within the project area are considered invasive species, meaning they spread aggressively and have negative impacts. These include crested wheatgrass, smooth brome grass, Kentucky bluegrass, and yellow sweet clover. Except for yellow sweet clover, these species were common in the vicinity of the project area. Some of these species may have been over seeded into the native grassland or may have spread from introductions elsewhere (Simmers 2009).

## 5.8 Wildlife

A wide variety of resident and migratory species of vertebrate and invertebrate species can be found in the project area throughout the year. The rolling mixed grass prairie and the woody cover in draws

southwest and southeast of the project area provide a variety of foraging and cover habitat types. It is likely that many game and non-game species occur in the project area including coyote, red fox, raccoon, badger, black-tailed jackrabbit, desert cottontails, and various species of rodents and bats. Maps available from the North Dakota Game and Fish Department (NDGFD) indicate that there are white-tailed deer, mule deer, and pronghorn populations within McKenzie County and the project area.

A variety of migratory song bird species may use the project area during migration and for breeding, nesting, and foraging. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) of 1918. Unless permitted by regulations, the MBTA makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. In addition to the MBTA, Executive Order 13186 sets forth the responsibilities of Federal agencies to further implement the provisions of the MBTA by integrating bird conservation principles and practices into agency activities and by ensuring that Federal actions evaluate the effects of actions and agency plans on migratory birds.

The 1988 amendment to the Fish and Wildlife Conservation Act mandates the USFWS to “identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973.” The Birds of Conservation Concern of 2008 is the most recent effort to carry out this mandate. The overall goal of this report is to accurately identify the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent our highest conservation priorities (USFWS 2008). The Project Area is located within Bird Conservation Region (BCR) Region 17, Badlands and Prairies, and **Table 5.2** lists the avian species on the Bird Conservation Region 17 that have the potential to occur in the vicinity of the project area.

**Table 5.2 Avian Species on the USFWS Birds of Conservation Concern (BCC) 2008 List**

Species	Seasonal Range and Preferred Habitat	Potential to occur in the project area	Potential to utilize Lake Sakakawea and associated riparian habitat
Horned grebe	Summer, breeds on lakes	No	Yes, potential nesting and foraging habitat
American bittern	Summer, Marsh habitat	No	Yes, potential nesting and foraging habitat
Bald eagle	Winter range, prefers sea coasts, rivers, and lakes	Yes, potential nesting and foraging habitat in close proximity to the Project Area. No bald eagles or bald eagle nest sites have been observed within the Project Area and there are no historical records of such (Schmoller, 2010).	Yes, potential foraging habitat
Ferruginous hawk	Summer breeding range	Yes, potential foraging habitat	Yes, potential foraging habitat
Golden eagle	Winter Range	Yes, potential foraging habitat	Yes, potential foraging habitat
Peregrine falcon	Out of Range, Cliffs near wetlands	Yes, potential foraging and nesting	Yes, potential foraging and nesting habitat

		habitat	
Prairie falcon	Summer/Year Round, w/in breeding range	Yes, potential foraging habitat	Yes, potential foraging habitat
Upland sandpiper	Summer breeding range, prefers grassy fields	Yes, potential nesting and foraging habitat	Yes, potential nesting and foraging habitat
Long-billed curlew	Summer breeding range, Nests on wetlands and dry uplands	Yes, potential nesting and foraging habitat	Yes, potential nesting and foraging habitat
Marbled godwit	Summer breeding range. Nests in grassy meadows near lakes and ponds.	Yes, potential nesting and foraging habitat	Yes, potential nesting and foraging habitat
Short-eared owl	Year round and summer range	Yes, potential foraging habitat	Yes, potential foraging habitat
Lewis' woodpecker	Uncommon in North Dakota	No, habitat not found	No, habitat not found
Red-headed woodpecker	Summer breeding range. Prefers farmland, orchards, shade trees in towns, large trees	Yes, potential foraging and nesting habitat	Yes, potential foraging and nesting habitat
Loggerhead shrike	Summer breeding range. Prefers semi-open country w/ lookout posts, wires, trees, scrub	Yes, potential foraging and nesting habitat	Yes, potential foraging and nesting habitat
Pinyon jay	Casual year round resident	Yes, potential foraging and nesting habitat	Yes, potential foraging and nesting habitat
Sage thrasher	Casual summer breeding range resident. Prefers sagebrush plant communities	Yes, potential foraging and nesting habitat	No, not likely to occur in riparian habitats
Sprague's pipit	Summer breeding range. Nests in grassy areas	Yes, potential foraging and nesting habitat	Yes, potential foraging and nesting habitat
Brewer's sparrow	Summer breeding range. Breeds in mountain meadows and sagebrush flats	Yes, potential foraging and nesting habitat	No, not likely to occur in riparian habitats
Sage sparrow	Casual summer range. Prefers alkaline flats, sagebrush, and salt brush	Yes, potential foraging and nesting habitat	Yes, potential nesting and foraging habitat
Grasshopper sparrow	Summer breeding range. Prefers pastures, grasslands, and old fields	Yes, potential foraging and nesting habitat	Yes, potential foraging and nesting habitat
Baird's sparrow	Summer breeding range. Uncommon and declining. Prefers grasslands and weedy fields	Yes, potential foraging and nesting habitat	No, not likely to occur in riparian habitats
McCrown's longspur	Summer breeding range. Prefers nesting in dry short grass plains	Yes, potential foraging and nesting habitat	No, not likely to occur in riparian habitats
Chestnut-collared longspur	Summer breeding range. Prefers Plains and Prairies	Yes, potential foraging and nesting habitat	No, not likely to occur in riparian habitats
Dickcissel	Summer breeding range. Prefers open weedy meadows, grain fields, prairie	Yes, potential foraging and nesting habitat	No, not likely to occur in riparian habitats

Suitable waterfowl habitat is not present within the project area. However, there is potential habitat adjacent to Lake Sakakawea, 0.5 mile north of the project area. During bird surveys conducted in 2009, 21 resident and migratory bird species were observed (**Table 5.3**) (Schultz and Simmer 2009) (see **Appendix I**).

**Table 5.3 Bird species identified during field surveys for the Adjacent XTO well site.**

Common Name	Scientific Name
Black-capped chickadee	<i>Poecile atricapilla</i>
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>
Prairie horned lark	<i>Eremophila alpestris</i>
American robin	<i>Turdus migratorius</i>
American tree sparrow	<i>Spizella arborea</i>
Bank swallow	<i>Riparia riparia</i>
Mountain bluebird	<i>Sialia currucoides</i>
killdeer	<i>Charadrius vociferous</i>
Least flycatcher	<i>Empidonax minimus</i>
Western meadowlark	<i>Sturnella neglects</i>
Yellow warbler	<i>Dendrocica petechia</i>
Canada goose	<i>Branta canadensis</i>
Mourning dove	<i>Zedaida macroura</i>
Turkey vulture	<i>Cathartes aura</i>
Eastern wood-pewee	<i>Contopus virens</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Grasshopper sparrow	<i>Ammodramus savannarum</i>
American goldfinch	<i>Phuvials dominica</i>
Western kingbird	<i>Tyrannus verticalis</i>
House sparrow	<i>Passer domesticus</i>

In North Dakota, the USFS Dakota Prairie Grasslands has identified several avian species in their Land and Resource Management Plan (USDA 2001 ) for which they apply stipulations to oil and gas leases on their lands mandated by 36 CFR 228 102 (c)(1)(ii). Known occurrences of species (active and historical) listed in this management plan within one mile of the project area includes two sharp-tailed grouse leks (display ground) and one prairie falcon nest (Gary Foli 2011). The closest sharp-tailed grouse leks are within 0.48 mile (line of sight) of the project area. Surface activities are prohibited from March 1 to July 15. In addition, the USFS specifies that no surface occupancy or use is allowed within 0.25 miles (line of sight) of a sharp-tailed grouse lek. The prairie falcon nest is beyond 0.25 miles (line of sight) from the project area. The USFS management plan specifies that no surface occupancy or use is allowed within 0.25 miles (line of sight) for this species.

## 5.9 Air Quality

Regional air quality is influenced by a combination of factors including climate, meteorology, the magnitude and spatial distribution of local and regional air pollution sources, and the chemical properties of emitted pollutants. Within the lower atmosphere, regional and local-scale air masses interact with

regional topography to influence atmospheric dispersion and transport of pollutants.

National Ambient Air Quality Standards (NAAQS) have been promulgated for the purpose of protecting human health and welfare with an adequate margin of safety. Pollutants for which standards have been set include sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), and particulate matter (PM) less than 10 or 2.5 microns in aerodynamic diameter (PM<sub>10</sub> and PM<sub>2.5</sub>). Existing air quality in the region is acceptable based on EPA standards for the protection of human health. The region is designated as an attainment area, meaning that the concentration of criteria pollutants in the ambient air is less than the NAAQS.

The Clean Air Act mandates prevention of significant deterioration in designated attainment areas, including Class I areas. There is a Class I air shed in North Dakota at the Theodore Roosevelt National Park, which is located approximately 37 miles (60 km) southwest of the project area. The area that the project is located can be considered a Class II air shed, which affords it a lower level of protection from significant deterioration (i.e. higher levels of ambient air quality standards). The NAAQS and PSD increments are presented in **Table 5.4**.

**Table 5.4 Ambient Air Quality Standards**

Pollutant	Averaging Period(s)	NAAQS (µg/m <sup>3</sup> )	PSD Class I Increment (µg/m <sup>3</sup> )	PSD Class II Increment (µg/m <sup>3</sup> )
SO <sub>2</sub>	Annual	80	2	20
	24-hour	365	5	91
	3-hour	1,300	25	512
NO <sub>2</sub>	Annual	100	2.5	25
	1-hour	188 <sup>a</sup>	-	-
PM <sub>10</sub>	24-hour	150	8	30
PM <sub>2.5</sub>	Annual	15	None	None
	24-hour	35	None	None
CO	8-hour	10,000	None	None
CO	1-hour	40,000	None	None
O <sub>3</sub>	8-hour	157	None	None

Source: EPA 2011.

## 5.10 Noise

Ambient human-generated noise levels within the area of the project area are currently low. No permanent residences or agricultural lands are located within one mile of the project area. There are only three active oil and gas wells within a one-half mile radius of the project area. There are very few roads in the general vicinity, and any that do exist are considered to be low volume.

## 5.11 Socioeconomics

The project area is located within McKenzie County, the largest county in North Dakota covering over 2,700 square miles. The population of McKenzie County has grown by approximately 1.1 percent per year from 2000 to 2009, resulting in an increase from 5,737 to an estimated 5,799 residents (U.S. Census Bureau 2009).

A number of activities bring dollars into McKenzie County providing the foundation for the local economy. Based on data collected between January 2005 and December 2009 by the Census Bureau,



industry groups in McKenzie County with the highest percentage of total employment were agriculture, forestry, fishing, and mining (27.2 percent); and education, health, and social services (22.1 percent).

In addition, the project area is located within an area that provides for dispersed recreation, including camping, boating, fishing, and hunting. Fishing is the most popular recreation activity in the area and for the GPO. Expenditures of anglers at least 18 years old for open water fishing in the Missouri River system were derived from the 2001 NDGFD expenditure survey data collected from resident and non-resident fishing license holders. Two types of expenditures were estimated: variable expenditures such as travel, food, lodging, gasoline, rentals, guide services, and bait; and fixed expenditures such as boats and fishing equipment. To obtain average daily expenditures representative of Lake Sakakawea anglers, daily expenditure data were averaged across individual zip codes. The resulting daily variable and fixed expenditures were \$41 and \$69, respectively, for residents and \$84 and \$35, respectively, for non-residents.

Grazing is also an activity that generates revenue. In 2007, the GPO had a total of 26 agricultural/grazing leases. Furthermore, the project area is located within a current Corps grazing lease.

The median household income in McKenzie County has grown 41 percent from \$29,342 in 2000 to \$41,333 in 2007 (U.S. Census Bureau 2000, Fed Stats 2007). In addition, an estimated 37.2 percent of the population was retired and did not earn wages. Watford City is the County Seat of McKenzie County and the largest city. The nearest town to the project area is Keene, North Dakota, which is located about 15 miles to the southeast, with a population of approximately 250 residents. Per capita income for Keene residents is \$14,732, whereas per capita income for the State of North Dakota is \$17,769. The median household income of Keene is \$41,333, compared to the median household income of \$43,936 in North Dakota (US Census Bureau 2009).

The NEPA process requires a review of the environmental justice issues as established by Executive Order 12898 (February 11, 1994). The order established that each Federal agency identify any “disproportionately high and adverse human health or environment effects of its programs, policies, and activities on minority and low-income populations.” Based on data collected in McKenzie County between January 2005 and December 2009 by the Census Bureau, 0.5 percent identified themselves as Black or African American, 0.3 percent identified themselves as Asian, and 1.7 percent of the residents identified themselves as Hispanic or Latino, all of which are below the State average (0.9 percent Black or African American, 0.8 percent Asian, and 2.0 percent Latino).

## **5.12 Cultural Resources**

Cultural resources are fragile and nonrenewable remains of prehistoric and historic human activity, occupation, or endeavor as reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features. Cultural resources comprise the physical remains themselves and the areas where significant human events occurred.

The National Historic Preservation Act (NHPA) of 1966 and the Archaeological Resource Protection Act of 1979 provide for the protection of significant cultural resources and traditional cultural properties. Section 106 of the NHPA describes the process that Federal agencies must follow to identify, evaluate, and coordinate their activities and recommendations concerning cultural resources. Significant cultural resources are defined as those listed on, or eligible for, listing on the National Register of Historic Places (NRHP) and are referred to as historic properties.

A Class I literature search identified earlier fieldwork and previously recorded sites within one mile of the project area (Juniper 2011). Thirteen sites are located within a one mile radius of the area of potential effect (APE), none of which are eligible to the NRHP. Class III surface inspections examined a 10-acre

block using parallel pedestrian transects spaced no more than 20 meters (65 feet) apart to cover the block. No new cultural resource material was encountered. No historic properties were identified within the APE on Corps-owned and administered land (Juniper 2011).



## **6.0 POTENTIAL IMPACTS/ ENVIRONMENTAL CONSEQUENCES**

### **6.1 Geology/Physiography**

#### **6.1.1 Alternative 1 – No Action**

Under the No Action Alternative, the project would not be allowed and no impacts to the geology/physiography of the project area would occur. Petroleum resources targeted by the project would remain available for future extraction.

#### **6.1.2 Alternative 2 – Approve Applicant’s Proposal**

If drilling proceeds and is successful, production of the wells would result in the retrieval of oil and natural gas from the Bakken Formation. Completion of the wells would also result in permanent fracturing of the target formation. Neighboring mineral reserves are protected by the NDIC regulation of a 500-foot setback on the outer section line boundaries of the applicant’s mineral spacing units. Subsidence of formations as an indirect result of fracturing or as a result of normal production is unlikely. No existing fracturing or subsidence problems are known for oil fields adjacent to the project area, some of which have been in existence for over 50 years. In addition, because the well pad and access road would be located on nearly flat ground, no slope instability would be created.

#### **6.1.3 Alternative 3 – Approve Applicant’s Proposal with Additional Mitigation**

Impacts to geology/physiography would be identical to the Alternative 2.

### **6.2 Climate**

The extent of climate change effects, and whether these effects prove harmful or beneficial, will vary by region, over time, and with the ability of different societal and environmental systems to adapt to or cope with the change.

The Intergovernmental Panel on Climate Change (National Academy of Sciences) concludes that “impacts of climate change will vary regionally but, aggregated and discounted to the present, they are very likely to impose net annual costs which will increase over time as global temperatures increase.” The National Academy of Sciences estimates that for increases in global mean temperature of less than 1-3°C (1.8-5.4° F) above 1990 levels, some places and sectors will see beneficial impacts while others will experience harmful ones. Some low-latitude and polar regions are expected to experience net costs even for small increases in temperature. For increases, in temperature greater than 2-3°C (3.6-5.4°F), the National Academy of Sciences says it is very likely that all regions will experience either declines in net benefits or increases in net costs. “Taken as a whole,” the National Academy of Sciences concludes, “the range of published evidence indicates that the net damage costs of climate change are likely to be significant and to increase over time.”

#### **6.2.1 Alternative 1 – No Action**

Under the No Action Alternative, the project would not be allowed and no impacts to the global climate would occur.

#### **6.2.2 Alternative 2 – Approve Applicant’s Proposal**

Activities associated with the wells as proposed are not anticipated to produce GHG emissions in amounts that would trigger any existing or propose reporting or permitting thresholds for GHG. Based on the expected magnitude of emissions from the Applicant’s Proposal and in relation to the amount of global GHG emissions, any contribution to cumulative effects on global warming from the proposal is

anticipated to be indistinguishable from natural variations in temperature on a global scale. Similar projects to the Applicant's Proposal in the same general area have also estimated that project emissions are not expected to affect global climate.

### **6.2.3 Alternative 3 – Approve Applicant's Proposal with Additional Mitigation**

Impacts to the global climate would be identical to the Alternative 2 – Applicant's Proposal.

## **6.3 Soils**

Potential impacts to soils in the project area include the removal of vegetation, mixing of soil horizons, soil compaction, increased susceptibility of the soils to wind and water erosion, contamination of soils with petroleum products, and loss of topsoil productivity. Impacts to soils are typically described in terms of short-term (or initial) and long-term (or residual) impacts. In disturbed areas where interim reclamation is implemented, ground cover by herbaceous species could potentially re-establish within two to four years following seeding of native plant species and diligent weed control efforts, consequently reducing soil erosion. These reclaimed areas have often been referred to as short-term disturbances. However, it is important to note that all surface disturbances could remain as long-term (or even permanent) impacts on the landscape if reclamation efforts are not successful.

### **6.3.1 Alternative 1 – No Action**

Under the No Action Alternative, the project would not be allowed and no soil disturbance would occur, other than from naturally occurring disturbances or current land uses.

### **6.3.2 Alternative 2 – Approve Applicant's Proposal**

The primary effect of surface disturbances on soil resources is increased erosion and the resulting potential increase in sediment yield to nearby drainages and Lake Sakakawea. As the soil types that would be disturbed for the construction of well pads and other project facilities are rated moderate for water erosion potential, if BMPs are not properly implemented, the increased erosion of soils could potentially lead to increased sedimentation and loss of vegetative cover.

Construction of the well pad, access road, and pipeline/utility corridor would initially disturb a total of about 5.95 acres, or about 0.9 percent of the area within a one square mile project area buffer of the well pad. Interim reclamation would reduce this amount of disturbance to approximately 3.72 acres of long-term disturbance.

Contamination of surface and subsurface soils can occur in oil and gas fields. Sources of potential contamination include leaks or spills from wellheads, conveyance pipelines, produced water sumps, and storage tanks. Petroleum released to surface soils infiltrates the soil and can migrate vertically until the water table is encountered. Leaks or spills of saline water, hydrofracturing chemicals, fuels, and lubricants could also result in soil contamination. Depending on the size and type of spill, the effect on soils would primarily consist of the potential loss of soil productivity.

The Applicant's Proposal has been designed to minimize soil disturbance in several important ways. The well pad is located in a nearly level area which minimizes cut and fill. Production facilities would be located on the cut portion of the pad and would be placed as close together and toward the center of the well pad as much as is feasible to maximize interim reclamation. In general, during actual construction of the access road and well pad, the area of soil disturbed would be minimized as much as is feasible and the area of interim reclamation would be maximized. No approaches/pull-outs along the road are planned and vehicle traffic beyond approved areas or off the access road once established would not be allowed.

Standard BMPs will be utilized to reduce erosion, including directing runoff away from cut and fill slopes

and other susceptible areas, compaction of road surfaces to prevent infiltration, use of drains or culverts if needed, use of slope stabilization or sediment control structures, and prompt revegetation. As part of the Applicant's Proposal, topsoil would be conserved. Topsoil excavated from the well pad and access road would be stockpiled for interim and final reclamation. At the completion of the project, or if a well is not productive, the well pad would be completely reclaimed. Reclamation would generally consist of, regrading the area to the approximate natural contours, spreading stockpiled soils over the disturbed area, reseeding with an approved seed mixture, and mulched with approved certified weed-free mulch.

To reduce the potential for hydrocarbon contamination of soils, pipelines and associated collection piping would be designed to minimize the potential for spills and leaks. Storage tanks would be surrounded by metal panel type berms capable of holding at least 110 percent of the largest single tank volume. Implementation of the project SPCC plans would minimize the risk of such spills by providing safeguards against spills and detailing reporting and cleanup measures to be taken in the event of a spill. A regional SPCC plan is located in **Appendix G**. A site-specific SPCC plan would be completed and implemented by Newfield following construction and during the seven-day inspection schedule.

### **6.3.3 Alternative 3 – Approve Applicant's Proposal with Additional Mitigation**

Impacts to soils under Alternative 3 would be minimized further through the use of a catch trench on the downslope end of the well pad which would minimize potential water erosion or sediment deposition on adjacent undisturbed land. Catchment trenches that receive storm water accumulations will be inspected for the presence of oil and drained as soon as possible through the use of vacuum trucks or other similar equipment. Records of the drainage events will be maintained and must include the amount drained, whether or not oil was present and contain a record of the approved disposal site where the wastewater was disposed. Copies of these records will be provided to the GPO upon request.

## **6.4 Water Resources**

Potential impacts to water resources in the project area from the Applicant's Proposal include:

- Increased sedimentation and turbidity of surface water as a result of surface disturbance and increased sediment delivery into area drainages via runoff;
- increased sediment loading to Lake Sakakawea; and
- adverse effects on surface water quality (i.e., potential contamination of surface water resources from spills or discharges of drilling fluids, petroleum, or other chemicals used for drilling and production activities).

The potential for adverse impacts to surface water resources would be greatest during project construction activities and would likely decrease in time due to natural stabilization, interim and final reclamation, and revegetation efforts.

### **6.4.1 Alternative 1 – No Action**

Under the No Action Alternative, the project would not be allowed and no impacts to the water resources of the area would occur, other than from naturally occurring disturbances or current land uses.

### **6.4.2 Alternative 2 – Approve Applicant's Proposal**

#### Surface Water

Slightly increased erosion of soils on the well pad and access road could occur. However, due to the flat terrain and the BMPs that would be employed, there is the potential that minor sedimentation to area

drainages or Lake Sakakawea may occur. The BMPs employed would be of two types: non-structural controls, and structural BMPs to control erosion. Non-structural controls include proper clearing, grading, and construction practices. Structural erosion control devices would be used as necessary to minimize the amount of sediment that reaches any drainage in the project area. Structural erosion control devices would include the use of a catch trench lined with an impervious liner constructed on the down slope end of the well pad to contain any water drainage from the proposed site. Other erosion control devices used would be specified during the APD process.

Approximately 10,000 barrels of water (1.16 acre-feet) would be needed to drill and complete each well, for a total water use of about 20,000 barrels (2.32 acre-feet). Fresh water for drilling and completion activities would be obtained from a permitted commercial supply located in Watford City, ND.

Contamination of surface water can occur in oil and gas fields. Sources of potential contamination include leaks from wellheads, gathering pipelines, produced water and storage tanks, and tanker trucks. Leaching of contaminants from impacted soils near these facilities also has the potential to contaminate surface water.

Hydrofracturing would be conducted as part of the Applicant's Proposal. Hydrofracturing is commonly used to enhance the recovery of oil from the Bakken Formation and involves the injection of water or other fluids, which may contain some petroleum constituents, and sand or some other "proppant" into the formation. Hydrofracturing would occur at depths that are at least 10,000 feet or more below the surface. Therefore, the potential for impacts to surface water resources from the proposed hydrofracturing is considered to be negligible.

The proposed project has been sited to avoid direct impacts to surface water and minimize disruption of drainages. Roadway engineering and erosion control measures, such as the use of a catch trench, would mitigate the potential migration of sediments downhill from the site. No measurable increase in runoff is expected as a result of project approval and prompt revegetation will be implemented.

The project would utilize proper storage and transport of chemicals, drilling/fracturing materials, and water in enclosed, lined tanks; secondary containment structures; enclosed human waste containers; and regular leak detection and maintenance to prevent pollution of runoff water from the well pad area. No produced water or materials would be released into drainages at any time. The closed loop system will be used to contain all drill cuttings and produced fluids. Trucks will transport these materials to State-approved disposal sites. Specifically, actions identified in the regional and site-specific SPCC plans would be implemented to minimize the chance that petroleum products and other chemicals would leave the site and contaminate surface waters (see **Appendix G**). If any spills were to occur, the operator would immediately contact the Corps, BLM, and any other regulatory agencies, as required by law or regulation. Strict cleanup efforts would be initiated within 24 hours.

To reduce the potential for hydrocarbon contamination of surface water, pipelines and associated collection piping would be designed to minimize the potential for spills and leaks. Metal panel type storage tanks would be surrounded by steel containment berms capable of holding at least 110 percent of the volume of the largest tank within the berm.

Since surface disturbance within close proximity to streams have the greatest potential for impacting water resources, rapid and successful reclamation/re-vegetation of temporarily disturbed areas and implementation of BMPs to reduce erosion are particularly important in minimizing water quality impacts and to assure maintenance of long-term stream health. These BMPs could include silt fences during construction, sediment traps, and waterbars, as appropriate. The specific BMPs that would be used would be identified with the APDs.

## Groundwater

Potential impacts to groundwater resources from the Applicant's Proposal include contamination with produced water, drilling mud, or petroleum constituents. Groundwater exists in shallow unconsolidated alluvium along Tobacco Garden Creek and in deeper bedrock formations beneath the project area. Spills of fuels or produced fluids from well pads and pipelines have the potential to contaminate groundwater resources. However, with the application of the mitigation measures described below, the potential for contaminating shallow groundwater aquifers is considered be low.

No impacts are expected for nearby unconsolidated aquifers (four miles away), water wells (0.5 miles away), or groundwater resources. Freshwater for drilling operations would be obtained from an off-site, commercial source so as not to deplete groundwater resources near the project area. The well bore will be drilled with fresh water only to 1,400 feet, which is 50 feet below the Fox Hills Formation aquifer, to prevent contamination of water sources. A surface casing would be installed and completely enclosed by cement from the surface to 1,321 feet depth which prevents chemical-containing drilling and fracturing fluids from entering groundwater sources. The closed loop drilling system for these wells ensures no chemicals, drilling/fracturing fluids, or produced water would leak into groundwater sources. Any evidence of groundwater contamination would result in a stop work order until all appropriate measures were identified and implemented.

### **6.4.3 Alternative 3 – Approve Applicant's Proposal with Additional Mitigation**

Impacts to water resources under Alternative 3 would be minimized further through the use of a catch trench on the downslope end of the well pad to prevent flow of surface runoff to adjacent undisturbed land. Furthermore, impacts would be reduced by lining the entire well pad and through the use of steel containment berms.

## **6.5 Wetlands/Riparian Habitat and Floodplains**

### **6.5.1 Alternative 1 – No Action**

Under the No Action Alternative, the project would not be allowed and no impacts to wetlands/riparian habitat would occur.

### **6.5.2 Alternative 2 – Approve Applicant's Proposal**

The two steep sided draws located to the southeast and southwest of the proposed project are separated by existing Corps roads. One of the draws contains an unnamed stream, which drains into Lake Sakakawea. BMPs such as silt fencing during construction would be located between the proposed access drive, well pad, and the existing roads, which will minimize any potential impacts to neighboring drainages.

### **6.5.3 Alternative 3 – Approve Applicant's Proposal with Additional Mitigation**

Impacts to wetland/riparian habitat and floodplains under Alternative 3 would be minimized further through the use of a catch trench located on the downslope side of the proposed well pad would prevent surface runoff and sediments from leaving the project area.

## **6.6 Threatened, Endangered, and Species of Concern**

### **6.6.1 Alternative 1 – No Action**

Under the No Action Alternative, the proposal would not be implemented and no impacts to threatened, endangered, and species of concern would occur other than from naturally occurring disturbances or current land uses.



## **6.6.2 Alternative 2 – Approve Applicant’s Proposal**

### **Black-footed Ferret**

Because prairie dog colonies do not occur in the action area, and black-footed ferrets have not been reintroduced in or near the action area, the project will have no effect on black-footed ferrets.

### **Gray Wolf**

Because the action area does not have forested cover or a suitable prey base for this species, and there have been no sightings in the vicinity of the action area, gray wolves are not likely to occur near the Pittsburgh-Federal 2H and 3H action area, and the proposed project will have no effect on gray wolves.

### **Interior Least Tern**

While there are no suitable nesting/foraging habitats in the immediate action area (on the proposed well pad or access road), because least tern could migrate through/over the project location to and from the lake, individual birds could be temporarily affected by visual (i.e., human and equipment activity, night lighting) and noise (i.e., drill rigs, equipment, human presence) related disturbance during the construction, drilling, and completion stages of the project. Specifically, these visual and noise intrusions could cause individual birds to veer from or be displaced from typical migratory routes, and/or temporarily avoid nesting or foraging locations north of the well pad along the lake. Historical data for the past 16 years indicates that the nearest interior least tern nest is located more than one mile from the proposed project location. Based on Newfield’s commitment to survey for least terns prior to construction activities occurring before August 15<sup>th</sup>, impose a one-mile buffer between project related activities and any active least tern nest, and cease construction, drilling or completion activity if nesting birds are documented within one mile of the well pad or access road, the project is not expected to affect breeding interior least terns. In addition, because construction, drilling, and completion are expected to occur after July 15 in the late summer/early fall of 2011, these potential effects could largely be avoided. However, because of the potential to temporarily affect individual least terns, the project may affect but is not likely to adversely affect the species.

### **Pallid Sturgeon**

The Applicant’s Proposal includes a suite of design features, such as earthen berms, and inspection and testing guidelines identified in the APD, SPCC plans, SWMPs, and Onshore Oil and Gas Order No. 2 and No. 3 intended to reduce the potential for petroleum spills or leaks, soil erosion, sediment yield, and storm water events. Based on these measures and the distance of the well pad from pallid sturgeon habitat, the proposed project is not expected to significantly affect water quality or quantity in Lake Sakakawea (Schmoller, 2010). However, because of the location’s proximity to the lake and the drainages that occur near the well pad, the Applicant’s Proposal may affect but is not likely to adversely affect pallid sturgeon.

### **Whooping Crane**

While there are no suitable wetland roosting or foraging habitats in the immediate action area (on the proposed well pad or access road), because whooping cranes could migrate through/over the project location to and from the lake, individual birds could be temporarily affected by visual (i.e., human and equipment activity, night lighting) and noise (i.e., drill rigs, equipment, human presence) related disturbance during the construction, drilling, and completion stages of the project. Specifically, these visual and noise intrusions could cause individual birds to veer from or be displaced from typical migratory routes, and/or temporarily avoid roosting or foraging locations north of the well pad along the lake. While Newfield has committed to cease construction, drilling, and completion activities if a whooping crane is observed in or near the project location, because of the potential to temporarily affect individual whooping cranes, the project may affect but is not likely to adversely affect the species.

### **Piping Plover**

While there are no suitable nesting/foraging habitats in the immediate action area (on the proposed well pad or access road), because piping plover could migrate through/over the project location to and from the lake, individual birds could be temporarily affected by visual (i.e., human and equipment activity, night lighting) and noise (i.e., drill rigs, equipment, human presence) related disturbance during the construction, drilling, and completion stages of the project. Specifically, these visual and noise intrusions could cause individual birds to veer from or be displaced from typical migratory routes, and/or temporarily avoid nesting or foraging locations north of the well pad along the lake. Historical data for the past 16 years indicates that the nearest piping plover nest is located more than one mile from the proposed project location. Based on Newfield's commitment to survey for piping plovers prior to construction activities occurring before August 15<sup>th</sup>, impose a one-mile buffer between project related activities and any active piping plover nest, and cease construction, drilling or completion activity if nesting birds are documented within one mile of the well pad or access road, the project is not expected to affect breeding piping plover. In addition, because construction, drilling, and completion are expected to occur after July 15 in the late summer/early fall of 2011, these potential effects could largely be avoided. However, because of the potential to temporarily affect individual piping plover, the project may affect but is not likely to adversely affect the species. Based on the distance of the proposed well pad and access road from critical habitat, and the conservation/minimization measures designed to reduce the potential for petroleum spills or leaks, soil erosion, sediment yield, and storm water events, the project is not expected to result in the destruction or modification of critical habitat.

### **Dakota Skipper**

The proposed project may displace individual butterflies and/or result in the loss of seasonal habitat due to construction of the proposed well pad and access road. However, because the primary habitat for the species is located in the steep draws to the southwest and southeast of the proposed well pad (not on the immediate well pad), the project would not significantly contribute to a trend toward federal listing or cause a loss of viability of or jeopardize the species.

### **Greater Sage Grouse**

As greater sage grouse habitats and populations have not been documented in the project area, nor are they expected to occur in the action. Based on Newfield's commitment to cease construction, drilling or completion activity if nesting birds are documented on the well pad or access road, the project is not expected to affect breeding greater sage grouse. Thus, the Pittsburgh-Federal 2H and 3H project would have no effect on the species, and would not significantly contribute to a trend toward Federal listing or cause a loss of viability of the species.

### **Sprague's Pipit**

Construction of the proposed well pad, access road, and pipeline/utility corridor will result in the loss of 5.95 acres of potential habitat for Sprague's pipits. Based on Newfield's commitment to cease construction, drilling or completion activity if nesting birds are documented on the well pad or access road, the project is not expected to affect breeding Sprague's pipits. Therefore, the proposed project may affect individuals through loss of potential habitat, but would not significantly contribute to a trend toward Federal listing or cause a loss of viability of the species.

### **Bald and Golden Eagles**

If construction, drilling, or completion activities extend into the late fall or early winter increased human presence, traffic, and associated noise level could deter eagles from feeding or taking shelter in the action area.

Disruptive activities in the flight path between important roosting and foraging areas on the lake may also interfere with feeding. As no eagle roosting sites have been located within the action area, surface-

disturbing activities under the Applicant's Proposal would not likely deter wintering eagles from utilizing or selecting roosting sites along the lakeshore. However, these activities could deter bald eagles from roosting within the steep draws adjacent to the well pad.

As previously stated, no bald eagle nests have been documented in the action area. One golden eagle nest was documented by the U.S. Forest Service approximately 1.5 miles southwest of the action area. This nest is out of the line of sight from the proposed well pad. In addition, based on Newfield's commitment to survey for raptors and impose a one-half mile buffer between project related activities and any active golden or bald eagle nest, the project is not likely to adversely affect nesting activity of either species.

Based on the information above, if construction, drilling and completion occurs during the late fall or early winter, the proposed project has the potential to affect individual eagles through temporary displacement from foraging or roosting habitats. However, the project would not significantly contribute to a trend toward re-listing of the bald eagle to the ESA, nor is it likely to adversely impact the golden eagle.

### **6.6.3 Alternative 3 – Approve Applicant's Proposal with Additional Mitigation**

Impacts to threatened, endangered, or candidate species would be identical to Alternative 2.

## **6.7 Vegetation and Invasive Species**

### **6.7.1 Alternative 1 – No Action**

Under the No Action Alternative, no impacts to vegetation within the project area would occur, other than from naturally occurring disturbances or adjacent mineral extraction activities.

### **6.7.2 Alternative 2 – Approve Applicant's Proposal**

The project area consists of reclaimed grasslands and not native prairie, thereby minimizing impacts to native plant communities. No significant impacts to sensitive plant species or their habitat are expected due to this project. Impacts to reclaimed grasslands within the project area would include temporary and long-term disturbance due to the construction of the proposed well pad and access road. The proposed well pad is adjacent to existing gas and oil exploration activities, which concentrates surface disturbance activities into a smaller area. Similarly, impacts have been minimized by the operator's proposal to follow an existing road for a portion of the access route. Construction activities associated with this project would cause approximately 5.95 acres of temporary vegetation loss, which would be reduced to 3.72 acres of long-term vegetation loss after interim reclamation.

Indirect effects of the proposed surface disturbance include increased potential for the introduction and spread of noxious and invasive weeds.

### **6.7.3 Alternative 3 – Approve Applicant's Proposal with Additional Mitigation**

Impacts to vegetation under Alternative 3 would be minimized further through pre and post construction noxious weed surveys conducted by a qualified biologist throughout the project area. Integrated weed management control measures specified by the USDA and the State of North Dakota would be completed by licensed herbicide applicators to reduce the threat posed by noxious weeds to native vegetation.

## **6.8 Wildlife**

### **6.8.1 Alternative 1 – No Action**

Under the No Action Alternative, no impacts to wildlife within the project area would occur, other than



from naturally occurring disturbances or adjacent mineral extraction activities.

### **6.8.2 Alternative 2 – Approve Applicant’s Proposal**

There would be up to 5.95 acres of wildlife habitat initially disturbed as a result of the Applicant’s Proposal; 5.62 acres from construction of the proposed well pad, 0.19 acres from construction of the proposed access road, and 0.14 acres from the installation of the pipelines and utility line. Following interim reclamation activities along the proposed access road, long-term habitat loss would be reduced to approximately 3.72 acres.

The severity of the direct and indirect impacts to general wildlife species under Alternative 2 would depend on the availability of habitats within and outside the Project Area, the sensitivity of the species to human activity, seasonal and daily timing of construction and development activities, and site-specific topography and vegetation (e.g., visually-obscured construction sites may affect adjacent wildlife less than where construction activities are in full view).

In general, project implementation would increase habitat loss and existing habitat fragmentation in the Project Area, as well as increase displacement from or avoidance of disturbed areas. Disturbance from drilling and construction activities with their attendant increased human presence and vehicle/equipment traffic could temporarily displace wildlife from their habitats. When displaced, wildlife individuals could move into less suitable habitats or into habitats where inter- and intra-specific competition for resources may occur. Direct impacts to wildlife individuals include subsequent adverse effects including deteriorated physical condition, decreased reproductive success, and increased general stress. Given the small-scale and short time frame for constructing, drilling and completing the two wells, these activities are not anticipated to cause long term declines to local wildlife populations.

Other direct impacts to wildlife species could include possible collisions between wildlife and motor vehicles operating in the Project Area during the construction, drilling and completion phases of the project.

### **6.8.3 Alternative 3 – Approve Applicant’s Proposal with Additional Mitigation**

Potential effects to wildlife would be similar to those described under Alternative 2.

## **6.9 Air Quality**

### **6.9.1 Alternative 1 – No Action**

Under the No Action Alternative, no air quality effects would occur in the general area of the proposed project, other than from nearby activities such as adjacent mineral extraction activities.

### **6.9.2 Alternative 2 – Approve Applicant’s Proposal**

Minor local air quality effects may occur within the general area of the proposed project due to regular construction and development activities including construction on roads and well pads, drilling and completion of each well, tanker traffic for oil and liquids pickup, and any temporary gas flaring that may occur. Temporary/intermittent emissions and road dust would be minimized by BMP’s that will include minimizing vehicle traffic, reducing vehicle speeds, applying dust suppressants on dirt roads such as water, and utilizing electric pump units and heater treaters.

Due to the size of the project and the BMPs listed above nothing more than minor air quality impacts are expected. In particular, cumulative well construction and development activities are not expected to affect attainment of applicable NAAQS standards.

As previously discussed, the nearest Class I air shed is the Theodore Roosevelt National Park, which is located approximately 37 miles (60 km) southwest of the project area. Due to the distance to the National Park and the size of the proposed project, the project is believed to have no effect on the air quality at the Class I area.

As an example of prospective emissions that could occur, what is generally considered the largest source of air emissions, well site drill rigs, are being analyzed. **Table 6.1** presents drill rig emissions from the prospective two wells.

**Table 6.1. Drill Rig Air Emissions – Proposed Project**

Pollutant	Emissions (lb/hp-hr)	Emissions (lb/hr)	Emissions (ton/yr)
NO <sub>x</sub>	0.0152	9.12	0.228
CO	0.0187	11.24	0.281
VOC	0.0022	1.32	0.033
PM <sub>10</sub>	0.0009	0.53	0.013
PM <sub>2.5</sub>	0.0009	0.53	0.013

<sup>a</sup>Drill rig emissions based on 1,500 hp, Tier I engines, and drilling two separate wells.

### **6.9.3 Alternative 3 – Approve Applicant’s Proposal with Additional Mitigation**

Impacts to air quality would be identical to those impacts resulting from Alternative 2 – Applicant Proposal.

## **6.10 Noise**

### **6.10.1 Alternative 1 – No Action**

Under the No Action Alternative, noise impacts would not occur in the general area of the proposed project, other than from nearby activities such as adjacent mineral extraction activities.

### **6.10.2 Alternative 2 – Approve Applicant’s Proposal**

The noise analysis is limited to changes in noise due to construction activities of the Applicant’s Proposal. Construction noise would be intermittent and generally in short durations. This level of noise could be considered by some an annoyance to any persons or animals within approximately 500 yards of the construction activity. No permanent residences are located within one mile of the proposed project. The Applicant’s Proposal would not be expected to substantially impact ground noise levels for any long term or short term duration. The co-location of wells would minimize noise due to reducing the total amount of area that the noise would originate from, as well as reducing vehicle traffic (i.e., concentrating activity at one pad).

### **6.10.3 Alternative 3 – Approve Applicant’s Proposal with Additional Mitigation**

Noise impacts would be identical to those impacts resulting from Alternative 2 – Applicant Proposal.

## **6.11 Socioeconomics**

### **6.11.1 Alternative 1 – No Action**

Under the No Action Alternative, the Applicant's proposal would not be approved. The existing environment on Corps lands in the project area would remain in its current condition. As such, local governments would continue to receive revenues generated from current activities, such as fishing, hunting, and grazing. In addition, job opportunities, impacts to grazing permittees, and other social impacts associated with development of the Applicant's Proposal would be less than those associated with the No Action Alternative.

#### **6.11.2 Alternative 2 – Approve Applicant's Proposal**

The Applicant's Proposal is not expected to have measurable impacts on demographic distributions, or revenues generated by current land uses and recreation activities (i.e., fishing, hunting, and grazing). However, the Applicant's Proposal would positively impact the local economies of McKenzie County through the creation of additional job opportunities in the oil and gas industry and in supporting trades and services. In addition, local governments in McKenzie County would experience an increase in tax and royalty revenues.

No environmental justice impacts are expected for local human residents, since the population of the area is low with no residences or towns nearby the project area. Any minor effects to the local population would not disproportionately affect low income or minority components of the population.

#### **6.11.3 Alternative 3 – Approve Applicant's Proposal with Additional Mitigation**

Impacts to socioeconomics would be identical to the impacts resulting from the implementation of Alternative 2 – Applicant Proposal.

### **6.12 Cultural Resources**

#### **6.12.1 Alternative 1 – No Action**

No impacts to cultural resources within the area would occur.

#### **6.12.2 Alternative 2 – Approve Applicant's Proposal**

No effects to cultural resources are expected from the Applicant's Proposal. All previously recorded sites are far enough away from the APE that they will not be affected by the project (Juniper 2011). Unknown (i.e., previously unidentified), eligible cultural resources in the project area could, however, be directly impacted and irreversibly damaged or destroyed by surface-disturbing activities, such as well pad, road, and pipeline excavation and grading. These resources could also be indirectly affected by atmospheric, visual, and auditory intrusions; increased visitation and traffic during project development and operation; vandalism; and erosion. Such changes on the landscape could lead to the damage, destruction, or removal of important scientific information, the loss of research potential, the loss of interpretation possibilities, and the destruction of the character or setting of the site. The potential for impacts to eligible cultural resources is unknown. If cultural resources are discovered during construction or operation, Newfield would immediately stop work, secure the affected site, and notify the Corps, ND SHPO, and THPO. Following any such discovery, Newfield would not resume construction or operations until written authorization to proceed was received from the Corps. Project personnel are prohibited from collecting any artifacts or disturbing cultural resources in the area under any circumstances. All personnel would be informed that collecting artifacts is a violation of Federal law and that employees engaged in this activity would be subject to disciplinary action. If cultural resource law violations are discovered, the offending employee would be subject to disciplinary action by Newfield and the violations would be reported to the appropriate Federal and State agencies, which may pursue prosecution.

#### **6.12.3 Alternative 3 – Approve Applicant's Proposal with Additional Mitigation**

Impacts to cultural resources would be identical to Alternative 2.

## **6.13 Cumulative Effects**

Cumulative impacts are those impacts that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable actions, regardless of which agency or person undertakes such other actions. For the purposes of this EA, the cumulative impact assessment area (CIAA) includes two large drainages east and west of the project area that drain into Lake Sakakawea. The drainage areas of the CIAA are buffered by 5 miles to include a total area of 966.6 square miles (see **Appendix A, Figure 7**).

### **6.13.1 Effects of Past and Present Land Use**

The dominant past and present land uses in the CIAA include farming, grazing, oil and gas development, minor rural and urban development, and recreation (hunting, fishing, water recreation, etc.). These land uses have affected the following resources in the past or currently:

- soils,
- water resources,
- wetlands,
- threatened and endangered species,
- vegetation and invasive species,
- wildlife,
- air quality,
- noise,
- socioeconomics,
- cultural resources,
- geology/physiography, and
- regional climate.

Currently, there are few reliable sources to quantitatively measure the effects that past and present lands uses have had on the resources listed above. Soils, vegetation, and wetlands of the area have been disturbed by past and present farming and residential development, though improvements in farming practices over time have likely reduced negative effects to soil quality and wetlands. Much of the CIAA has been converted long-term to agricultural use. Large portions of the CIAA consist of badland topography that is used for grazing of livestock. Though grazing does not involve a permanent conversion of ecosystems, it has long-term cumulative effects by affecting species composition and spreading invasive plant species. Water quality of the region (including in the Lake) has likely decreased somewhat over time due to sedimentation and pollution related to poor agricultural practices.

Wildlife and remnant native plant communities in the CIAA have been affected by habitat loss and degradation due to livestock grazing regimes and invasive species, contributed to by farming, grazing, and all types of development. Another major impact has been fragmentation of remaining wildlife habitat which has occurred in the region due to farming, oil/gas development, and associated roads networks, power lines, pipelines, and related infrastructure. The project is within an extensive and active oil and gas producing region, with hundreds of previously drilled wells and numerous producing wells within the region (**Appendix A, Figure 5**). The interaction of habitat loss, fragmentation, and further degradation by invasive species has likely caused local populations declines or shifts for some wildlife and plant species.

Past, present and reasonably foreseeable activities would increase habitat loss and existing habitat fragmentation in the CIAA, as well as increase displacement from or avoidance of disturbed areas. Disturbance from drilling and construction activities with their attendant increased human presence and vehicle/equipment traffic could displace wildlife from their habitats. When displaced, wildlife individuals could move into less suitable habitats or into habitats where inter- and intra-specific competition for resources may occur. Cumulative impacts to wildlife from displacement could include deteriorated physical condition, decreased reproductive success, and increased general stress. Depending on the extent of past, present and reasonably foreseeable activities and associated impacts on wildlife, cumulative effects to be limited to adverse effects on individual animals or could result in population level impacts and losses.

The most salient past and present land use in the CIAA on threatened and endangered species is likely be the construction of Garrison Dam, which modified habitat and disturbed natural flooding regimes on which several of these species depend. Ongoing and improved dam management by the Corps has partially mitigated the effects to some of these species.

Air quality has likely decreased slightly and noise levels have likely increased slightly from farming, development, and recreation activities. However, current air quality data indicate that the region is in attainment (**Table 5.4**).

Many elements of human society and the environment are sensitive to climate variability and change. Human health, agriculture, natural ecosystems, coastal areas, and heating and cooling requirements are examples of climate-sensitive systems. Rising average temperatures are already affecting the environment. Some observed changes include shrinking of glaciers, thawing of permafrost, later freezing and earlier break-up of ice on rivers and lakes, lengthening of growing seasons, shifts in plant and animal ranges and earlier flowering of trees (National Academy of Sciences 2007).

Socioeconomics have benefited from development activities and recreational opportunities in the area.

Some cultural resources have potentially been disturbed, lost, or destroyed by farming, non-regulated early development, exploratory oil and gas development, and the creation of Lake Sakakawea.

### **6.13.2 Effects of Reasonably Foreseeable Future Actions**

The types of land uses in the CIAA are expected to be similar in the future, but the levels of use may change. The resources likely to be most affected by cumulative future land uses include water resources, vegetation, and wildlife. Resources that are expected to experience moderate cumulative effects include geology, soils, wetlands, threatened and endangered species, air quality, climate, noise, socioeconomics, and cultural resources. Resources expected to have no or negligible effects from reasonably foreseeable activities include physiography, and environmental justice.

Global temperatures are expected to continue to rise as human activities continue to add carbon dioxide, methane, nitrous oxide, and other greenhouse (or heat-trapping) gases to the atmosphere. Most of the United States is expected to experience an increase in average temperature (National Academy of Sciences 2007). Precipitation changes, which are also very important to consider when assessing climate change effects, are more difficult to predict. Whether or not rainfall will increase or decrease remains difficult to project for specific regions. The extent of climate change effects, and whether these effects prove harmful or beneficial, will vary by region, over time, and with the ability of different societal and environmental systems to adapt to or cope with the change.

The Intergovernmental Panel on Climate Change (IPCC) concludes that “impacts of climate change



will vary regionally but, aggregated and discounted to the present, they are very likely to impose net annual costs which will increase over time as global temperatures increase.” The IPCC estimates that for increases in global mean temperature of less than 1-3°C (1.8-5.4° F) above 1990 levels, some places and sectors will see beneficial impacts while others will experience harmful ones. Some low-latitude and polar regions are expected to experience net costs even for small increases in temperature. For increases, in temperature greater than 2-3°C (3.6-5.4°F), the IPCC says it is very likely that all regions will experience either declines in net benefits or increases in net costs. “Taken as a whole,” the IPCC concludes, “the range of published evidence indicates that the net damage costs of climate change are likely to be significant and to increase over time.” (National Academy of Sciences 2007).

Farming, grazing, and the present level of rural and urban development are expected to stay at about the same levels, mostly restricted by the landforms of the area and land allotments. Improvements in farming and grazing practices could benefit and improve soils, vegetation, wetlands, and wildlife habitat resources. Otherwise, these land uses would continue to have at least some negative impacts depending on individual landowner management regimes. Rural and small urban development might gradually continue to decrease, as is the current trend in the region. Reduced rural or agricultural use of the area could reduce effects to water, soils, vegetation, wildlife, air quality, and noise. Conversely, reduced rural use of the CIAA could lead to increased development of “ranchettes” or hobby farms, which tend to increase habitat fragmentation, light pollution, and have other negative impacts on natural resources compared to conventional farming/ranching.

The spread of invasive and noxious weeds is a concern in areas proposed for surface development activities. Noxious weeds are plants that are designated by a Federal, State, Tribal or county government as injurious to public health, agriculture, recreation, wildlife, or property. A noxious weed is commonly defined as a plant that grows out of place and is competitive, persistent, and pernicious (James et al. 1991). Invasive weeds include plants that are not listed as noxious, but are not native to a particular region. Many consider a plant invasive if it has been introduced into an environment where it did not evolve. As a result, invasive plants do not have any natural enemies (e.g. herbivores or other plants) to limit their reproduction. Both invasive and noxious weeds can spread through areas undeterred, producing significant changes to native vegetation communities. The most common locations for noxious and invasive weeds include existing disturbance areas such as well pads, roadsides, pipeline ROWs, adjacent washes, and areas where overgrazing has disturbed native species. Roads may be the first point of entry for exotic species into a new landscape, and may serve as a corridor for plants moving farther into the landscape (Forman and Alexander 1998, Gelbard and Belnap 2003). Recreational activities, livestock grazing, and oil and gas development all have the potential to contribute to the spread and effects of noxious and invasive weeds. In addition, recreational activities along the lakeshore and on the lake have the potential to lead to and increase the presence of aquatic nuisance species such as zebra mussels, quagga mussels, and salt cedar. Hunting, fishing, and boating activities also contribute to noise and visual impacts and subsequent displacement of wildlife.

Oil and gas development is expected to increase in the region, as the Bakken Formation continues to be explored. When this EA was prepared, multiple exploratory wells had been proposed or approved within a 20 mile radius of the project area (**Appendix A, Figure 6**). None of these proposed wells were within five miles of this project. Surface disturbance from the construction of future oil and gas well pads, access roads, pipelines, and other production facilities will incrementally increase the loss and fragmentation of wildlife habitats. Similarly, future oil and gas development will contribute to wildlife displacement from or avoidance of disturbed areas. When displaced, wildlife individuals could move into less suitable habitats or into habitats where inter- and intra-specific competition for resources may occur.



Generally speaking, reasonably foreseeable future actions could incrementally and cumulatively add to the loss of important cultural resources across the CIAA. These types of impacts could present consequences for the breadth, completeness, and interpretive value of the archaeological record and cultural landscape. Many potential cumulative impacts to cultural resources would be reduced through the implementation of ACEPMs, agency required measures, and mitigation measures such as Class III cultural resource surveys; adherence to Federal regulatory laws, actions, and guidelines designed to protect cultural resources; and through the consultation process with the appropriate SHPO and/or THPO. However, it is anticipated that such measures would not prevent all cumulative impacts from occurring.

### **6.13.3 Cumulative Effects of Applicant's Proposal and Alternatives**

Approval of the proposed project, Alternative 2, is expected to have small to negligible effect on the human environment based on the minimal surface disturbance proposed and design features intended to reduce environmental effects. However, all incremental increases in surface disturbance, noise impacts, visual intrusions, etc., have to be considered in the context of cumulative effects. Resources which are expected to have minor or no cumulative impacts due to the proposed project include geology/physiography, climate, soils, water resources, wetlands, threatened and endangered species, vegetation and invasive species, wildlife, air quality, noise, environmental justice, socioeconomics, and cultural resources.

The proposed project would impact approximately 5.95 acres of soils, wildlife habitat, and native plant communities directly (i.e. loss or long-term conversion). This impact would primarily be due to the construction of the access road and well pad in some areas of native mixed grass prairie. Indirect impacts such as additional habitat fragmentation would be minimal since the project would use an existing two-track road for a portion of the access road and otherwise is located in areas already heavily invaded by non-native species. Potential spread of invasive species from construction activities is expected to be minimal with the use of the best management practices outlined in this document. Final reclamation would mitigate the long-term effects to soils, vegetation, and wildlife that would occur temporarily.

Implementation of the Applicant's Proposal when combined with all other reasonably foreseeable future actions in the CIAA would result in increased employment. In terms of health and safety, it should be recognized that oil and gas development and production operations are inherently hazardous activities. As such, employees would likely be exposed to occupational hazards associated with construction, drilling, completion, and production activities in proportion to their employment. However, these impacts would largely be minimized as the work environment for drilling and operations is governed by a variety of Federal and State regulations that promote worker safety. Any potential degradation to resources from oil and gas development in the CIAA would not disproportionately affect communities in the CIAA when compared to other nearby communities.

Most effects would be avoided or minimized by implementing mitigation measures (**Section 7.0**). Potential co-location of future wells would further reduce cumulative impacts to resources.

Additional cumulative actions under Alternative 3, to approve the applicant's proposal with additional protective and mitigation measures, are not expected to differ from those described for **Alternative 2**.

No additional cumulative impacts are expected under Alternative 1, the no-action alternative, other than from those occurring from other current and future land uses described in **Sections 6.13.1 and 6.13.2**.

## 7.0 MITIGATION SUMMARY

Mitigation measures and avoidance under Alternatives 2 and 3 are summarized below.

**Table 7.1. Comparison of Mitigation Measures under Alternative 2 and 3**

Resource	Potential Impacts	Alternative 2	Alternative 3
Geology/ Physiography	Permanent mineral retrieval	None	None
	Permanent fracturing of target formation	None	None
	Neighbor mineral reserves	550-foot setback from spacing unit boundary	Same
Climate	None	None	None
Soils	Temporary disturbance	Minimized by co-locating wells, locating well pad in level area, locating access route along natural contours, locating utilities and pipelines along road route, placing production facilities close together and near center of well pad, minimizing construction disturbance, maximizing interim reclamation, no approaches along access road, no traffic in undisturbed areas.	Same
	Long-term disturbance	Minimized by co-locating wells, interim and final reclamation.	Same
	Erosion	Minimized by co-locating wells, locating road along natural contours, avoiding steep slopes, avoiding drainages, minimizing cut and fill slopes, directing runoff, using stabilization and sediment control structures, prompt revegetation.	Further minimized by catch trench to reduce water erosion and sediment deposition on adjacent land.
	Spills	SPPC plan to prevent occurrence.	Same
Surface Water	Sedimentation	Minimized by avoiding drainages, controlling surface runoff, minimizing erosion, using sediment control structures, prompt revegetation.	Further minimized by catch trench to reduce water erosion and sediment deposition on adjacent land.
	Leaks	Prevented through proper storage and transport, closed loop drilling system, lined tanks, secondary containment, regular leak detection and maintenance of facilities.	Same
	Spills	SPPC plan to prevent occurrence.	Same
Groundwater/ Aquifers	Leaks	Prevented through use of freshwater for drilling through freshwater zone, cemented casing set to 1,321 which is 50 feet below the base of the Fox Hills Formation isolating all near surface freshwater aquifers, closed loop drilling system.	Same
Wetlands/	Direct disturbance	Wetlands avoided.	Same

Riparian Habitat	Sedimentation into downstream drainages.	Prevented through use of erosion and sedimentation control.	Further minimized by catch trench to reduce water erosion and sediment deposition on adjacent land.
Threatened, Endangered, Species of Concern	Bald and golden eagles	Proposed action would not impact potential roosting/nesting trees.  To avoid nesting season, construction, drilling, and well completion would occur after July 15.	Same
	Dakota skipper butterfly	Avoidance of areas with high native plant diversity and abundance. Minimizing disturbance of native soil and vegetation.	Same
	Interior least tern	Minimized by conducting surveys for interior least terns prior to construction activities, impose a one-mile buffer between project related activities and any active least tern nest, and cease construction, drilling or completion activity if nesting birds are documented within one mile of the well pad or access road.  Minimized because construction, drilling, and completion are expected to occur after July 15 in the late summer/early fall of 2011.	Same
	Pallid sturgeon	Proposed erosion and Sedimentation control measures would minimize potential impacts to the drainages east and west of the project area that connect to Lake Sakakawea.	Proposed well pad catch trench would further reduce the chance erosion and sediment deposition enhancing water quality protection.
	Piping plover	Minimized by conducting surveys for piping plovers prior to construction activities, impose a one-mile buffer between project related activities and any active piping plover nest, and cease construction, drilling or completion activity if nesting birds are documented within one mile of the well pad or access road.  Minimized because construction, drilling, and completion expected to occur after July 15 in the late summer/early fall of 2011.	Same
	Sprague's pipit	Minimizing disturbance of native soil and grassland vegetation.	Same
	Whooping crane	Avoidance of areas with wetland-cropland habitat.  Further minimized by suspending construction if a crane is sighted within one mile of project.	Same

Vegetation/ Invasive Species	Temporary disturbance	Minimized by co-locating wells, locating portion of access road on existing two-track road, locating utilities and pipelines along existing road route and , minimizing new construction disturbance, maximizing interim reclamation, no approaches along access road, no traffic in undisturbed areas.	Same
	Long-term disturbance	Minimized by co-locating wells, interim and final reclamation, using native seed mixtures only.	Same
	Spread of invasive species/noxious weeds	Prompt reclamation, chemical spot-treatments as needed, cleaning equipment and vehicles off Corps land, using certified weed-free materials, and seed.	Further minimized by chemical treatment of existing noxious weeds prior to construction.
Wildlife	Temporary disturbance, displacement, habitat fragmentation	Minimized by co-locating wells, locating portion of access road on existing two-track road, locating utilities and pipelines along road route, locating road and well pad in areas of low habitat quality, minimizing construction disturbance and noise, maximizing interim reclamation, no traffic in undisturbed areas.	Further minimized by implementing surface occupancy and timing limitation stipulations.
	Long-term disturbance, displacement, habitat fragmentation	Minimized by co-locating wells, interim and final reclamation, using native seed mixtures only.	Further minimized by implementing surface occupancy and timing limitation stipulations.
	Mortality, increased exposure	Minimized by low vehicle speeds, minimizing construction activities, eliminating hazards by keeping clean well site and enclosing tanks, netting pits, fencing well pad area.	Further minimized by implementing surface occupancy and timing limitation stipulations.
	Migratory Birds/Raptors	Minimized by above measures, siting of project area in non-preferred habitat for most species, no tree removal, and utilizing closed-loop drilling system.  To avoid nesting season, construction, drilling, and well completion would occur after July 15.  Avoidance of breeding/nesting season during construction and maintaining half-mile buffer for eagle nests.	Same
Air Quality	Temporary increase in dust, emissions	Minimized by co-locating wells, locating utilities and pipelines along road route, minimizing traffic and speeds, utilizing electric pumping units, enclosing tanks, vapor	Same

		recovery, maintaining and inspecting equipment, H2S safety plan, suppressing road dust.	
Noise	Intermittent and temporary increase	Minimized by avoiding permanent residences, collocating wells	Same
Socioeconomics	Economic benefits	None	None
Cultural Resources	None	Discovery of cultural artifacts would result in suspension of construction.	Same

## 8.0 CONSULTATION AND COORDINATION

A pre-scoping courtesy letter was provided to interested agencies and individuals to identify the initial concerns of these interested parties (**Table 8.1**). In addition, this EA will be circulated for a 30-day review and comment period to the following concerned agencies and individuals (**Table 8.1**).

**Table 8.1. Pre-scoping Courtesy Letter Recipients**

Agency Contact
<b>MHA Nation – Three Affiliated Tribes</b>
Tex G. Hall, Chairman
Annette Young Bird, Natural Resource Administrator
Fred Fox, Tribal Energy Department Administrator
Antoine Fettig, Biologist Fish and Wildlife Division
Fred Poitra, Director Fish and Wildlife Division
Elgin Crows Breast, Tribal Historic Preservation Officer
<b>U.S. Department of Agriculture</b>
Ron Hecker, District Ranger Forest Service Little Missouri National Grasslands
Paul Sweeney, State Conservationist Natural Resources Conservation Service North Dakota State Office
<b>U.S. Department of Defense</b>
Dan Cimarosti, Regulatory Project Manager U.S. Army Corps of Engineers North Dakota State Regulatory Office
<b>U.S. Department of the Interior</b>
Jeffrey Fleischman, Field Office Director Office of Surface Mining Reclamation and Enforcement Casper Field Office Western Region
Lonny R. Bagley, Field Manager Bureau of Land Management North Dakota Field Office
Jeffery Towner, Field Supervisor U.S. Fish and Wildlife Service Ecological Services
Howard Bemmer, Superintendent Bureau of Indian Affairs Fort Berthold Agency
William Benjamin, Regional Director Bureau of Indian Affairs Great Plains Regional Office
<b>North Dakota State Government Agencies</b>
Steve Dyke, Conservation Supervisor North Dakota Game and Fish Department
Bruce Kreft, Conservation Biologist North Dakota Game and Fish Department
Kent Luttschwager, Wildlife Resource Mgmt Supervisor North Dakota Game and Fish Department



Fred Ryckman, Northwest Fisheries District Supervisor North Dakota Game and Fish Department
Dave Fryda, Missouri River Fisheries Supervisor North Dakota Game and Fish Department
John Paczkowski, P.E., CFM , Regulatory Section Chief North Dakota State Water Commission
Susan Quinnell, Review and Compliance Coordinator North Dakota State Historical Society Bismarck Office
Mike Sauer, Senior Environmental Scientist North Dakota Department of Health
Bruce E. Hicks, Assistant Director North Dakota Industrial Commission Oil and Gas Division
Lynn D. Helms, Director North Dakota Industrial Commission Oil and Gas Division
Jesse Hanson, Planning & Development Division Mgr. North Dakota Parks and Recreation Department
Mike Brand, Director North Dakota State Land Department Surface Management Division
<b>McKenzie County Agencies</b>
Roger Chinn, Chairman McKenzie County Board of Commissioners
Keith Winter, President McKenzie County Grazing Association
Denton Zubke, Chairman McKenzie County Water Resource District
<b>Other</b>
Terry Fleck, Chairman Friends of Lake Sakakawea
Brian Kietzman, President North Dakota Chapter of the Wildlife Society
Blaine Nordwall Sierra Club
Audubon Dakota

## 9.0 STATUS OF ENVIRONMENTAL COMPLIANCE

The following list documents the status of the applicant's compliance with applicable environmental laws and regulations. Blank boxes indicate that compliance is yet to be completed for those items. All compliance will be completed as the planning process is finalized, and prior to any construction activities occurring.

### NEPA: Final EA with draft Finding of No Significant Impact (FONSI)

- ☒ Complete the draft EA
- ☐ Upon district acceptance of draft EA, distribute the EA to interested parties and agencies for 30 day review.
- ☒ If necessary, hold public/agency meeting.
- ☐ Incorporate agency and public comments, and finalize EA (incl. update on compliance status with environmental review and consultation requirements).
- ☐ Provide draft FONSI to Omaha District

### Section 404 and 401 of the Clean Water Act

- ☒ The Applicant's Proposal will not result in the placement of dredged or fill material into waters of the U.S. (EA Sections 5.5, 5.6), therefore a 404 permit/401 certification is not required.

### Endangered Species Act Section 7

- ☒ Preliminary review of publicly available USFWS information on listed species in county of project area (EA Section 5.6).
- ☒ Request the USFWS provide a list of threatened, endangered, proposed, and candidate species and designated critical habitats that may be present in the project area.
- ☒ If listed species may be found in the area, determine whether the project *may affect* a listed species, and provide the affect determination (biological assessment – **Appendix I**) to the Omaha District Office (**Section 6.6**).
- ☐ Corps District review and adoption of the biological assessment prepared by the applicant.
- ☒ Corps District informal consultation with the USFWS. Consultation will either result in:
  1. Concurrence on *not likely to adversely affect* determination (Section 7 consultation complete)
  2. Biological Opinion from USFWS.
- ☐ Letter/memo indicating concurrence/biological opinion from USFWS and completion of Endangered Species Act (ESA) coordination included in EA.

### Fish and Wildlife Coordination Act

- ☒ The Applicant's Proposal is not a water resource development project. No changes or modifications are expected for streams, wetlands, or any bodies of water for which this act would apply (EA Sections 5.5, 5.6).
- ☐ Coordinate with the USFWS and obtain a planning aid letter in the initial phases of the project.
- ☐ Final FWCA report or other documentation of compliance (memo from USFWS, other communication) upon final submission of package to District.

### Wild and Scenic Rivers Act

- ☒ No proposed or designated wild or scenic rivers or river reaches will be affected by the Applicant's Proposal (EA Sections 5.4.1, 6.4.2).

### Clean Air Act

- ☑ Determination showing the action is consistent with the Implementation Plan of the affected jurisdiction.

**HTRW Related – Comprehensive Environmental Response, Compensation and Liability Act, the Resource Conservation and Recovery Act, and the Toxic Substances Control Act**

- ☑ Document that appropriate Federal, State and/or Tribal agencies with jurisdiction or expertise have been given reasonable opportunity to comment on the Applicant's Proposal, and their input has been fully considered.

**National Historic Preservation Act and Related Statutes**

- ☑ Action takes into account effects on historic and cultural properties. Class III Cultural Resource Inventory completed (EA Sections 5.12, 6.12).
- ☑ Corps District submittal of Class III Inventory report to State and/or Tribal agencies.
- ☑ Correspondence with appropriate State and/or Tribal agencies, including completed determination of significance.

**Noise Control Act**

- ☑ Document significance of noise likely to be generated during construction and implementation of the proposed project. No significant noise is expected (**Sections 5.10, 6.10**).

**Bald Eagle Protection Act**

- ☑ Ensure no active bald eagle nests are within a 0.5 mile radius of the proposed project site or ensure no activity would take place from February through May.

**Environmental Justice**

- ☑ Project would not disproportionately affect minority populations or low-income populations (**Sections 5.11, 6.11**).

**Farmland Protection Act**

- ☑ No prime farmland would be converted or affected as a result of the proposed project (**Sections 5.3, 6.3**).

**Flood Plain Management**

- ☑ Floodplains or flood hazard zones have not been identified for the project area (**Sections 5.5, 6.5**).

**Migratory Bird Treaty Act**

- ☑ Proposed project does not adversely affect migratory birds through avoidance of disturbances of nesting habitats during the active nesting season (**Sections 5.8, 6.8**). Approval of Alternative 3 would ensure further avoidance of potential impacts (**Sections 4.2.3.2, 6.8.3**).

## 10.0 LIST OF PREPARERS

Kleinfelder, Inc. / Buys and Associates prepared this EA under contract to Newfield Production Company and in cooperation with the United States Army Corps of Engineers. Preparers, reviewers, consultants and Federal officials include the following:

**Table 10.1 Preparers, Reviewers, Consultants, and Federal Officials**

<b>Name</b>	<b>Title / Role</b>
Dawn Martin	NEPA Program Manager, Kleinfelder, Inc. / Buys and Associates Project manager, document preparation
Chrissy Lawson	Environmental Planner, Kleinfelder, Inc. / Buys and Associates Assistant project manager, author, document preparation
Andy Antipas	NEPA Project Manager, Kleinfelder, Inc. / Buys and Associates Author
Dustin Collins	Air Quality Specialist, Kleinfelder, Inc. / Buys and Associates Author
Dave Nicholson	Senior Professional Geologist, Kleinfelder, Inc. / Buys and Associates Author
Eric Sundberg	Regulatory Lead, Newfield Production Company
Candice Twitty	Regulatory Technician, Newfield Production Company
Charles Sorenson	Natural Resource Specialist, U.S. Army Corps of Engineers Project Office project manager, reviewer
Heather Hundt	Environmental Compliance Coordinator, U.S. Army Corps of Engineers Reviewer
Mike Morris	Natural Resource Specialist, U.S. Army Corps of Engineers Reviewer
Heidi Riddle	Fish and Wildlife Biologist, U.S. Fish and Wildlife Service
Johnathan Shelman	Environmental Resource Specialist, U.S. Army Corps of Engineers Reviewer
Eric Laux	Environmental Resource Specialist, U.S. Army Corps of Engineers Reviewer
Douglas Simpleman	Project Manager, U.S. Army Corps of Engineers Reviewer

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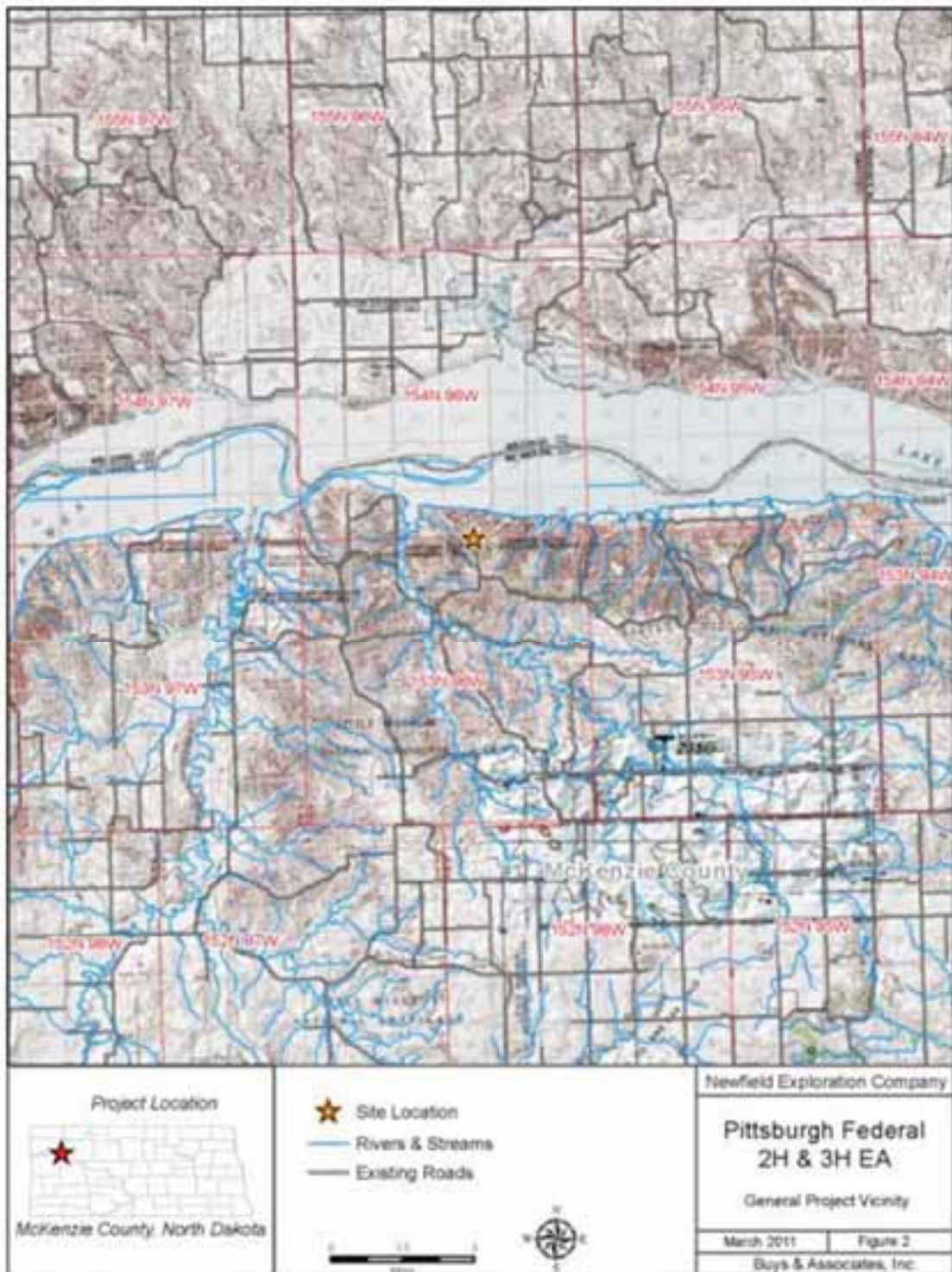
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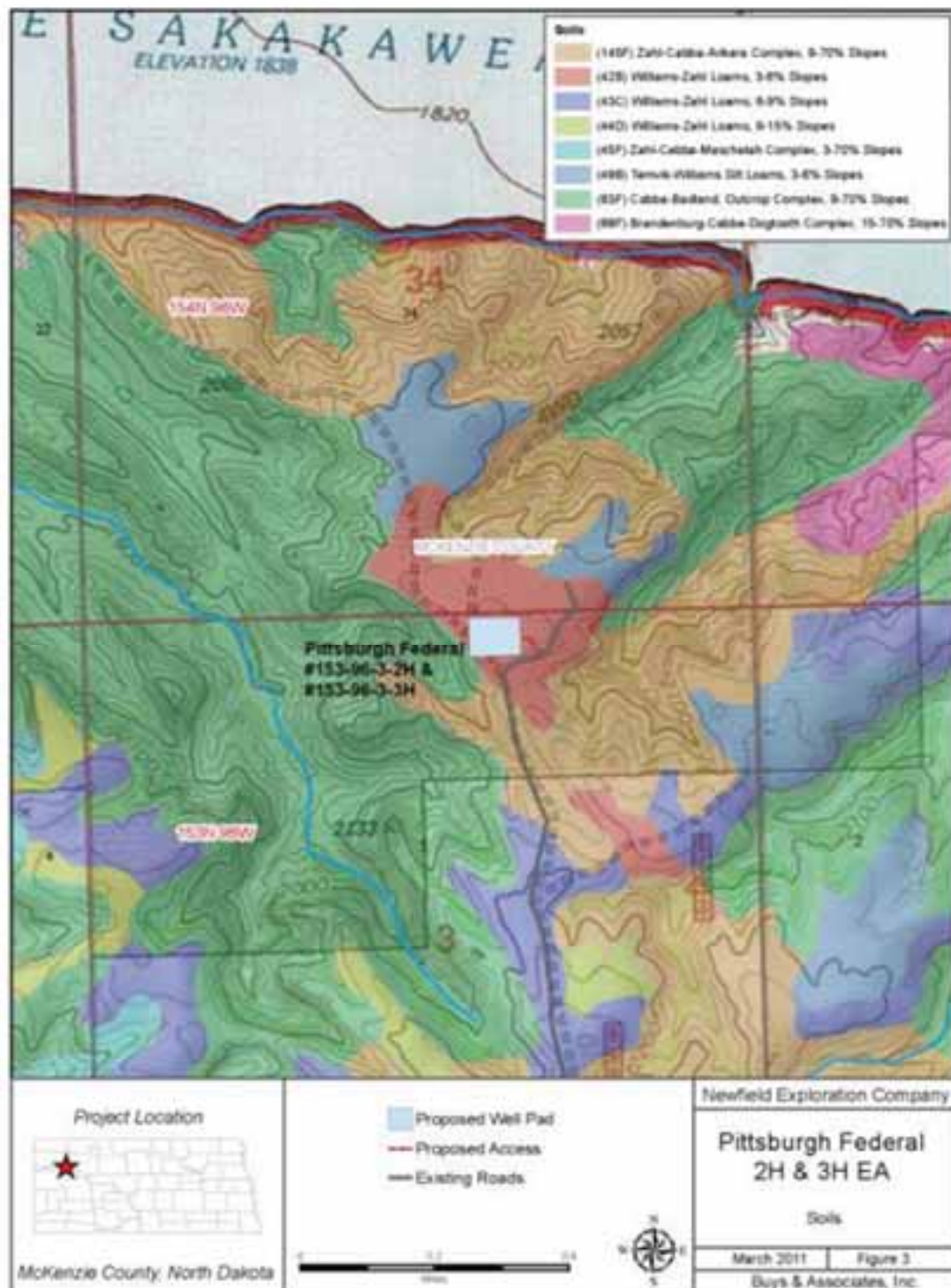
# Appendix A

## Figures for Pittsburgh Federal 2H and 3H Environmental Assessment



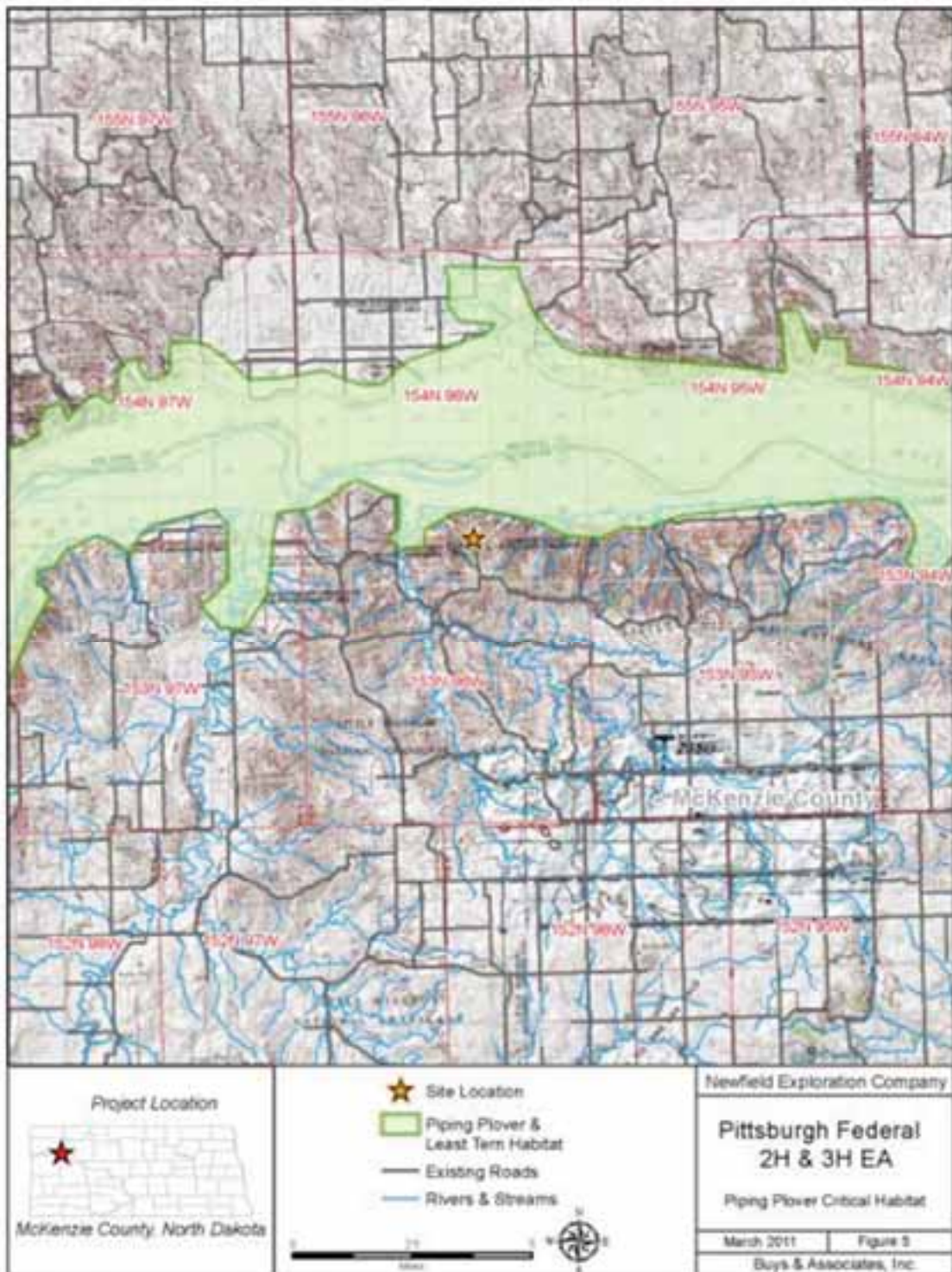








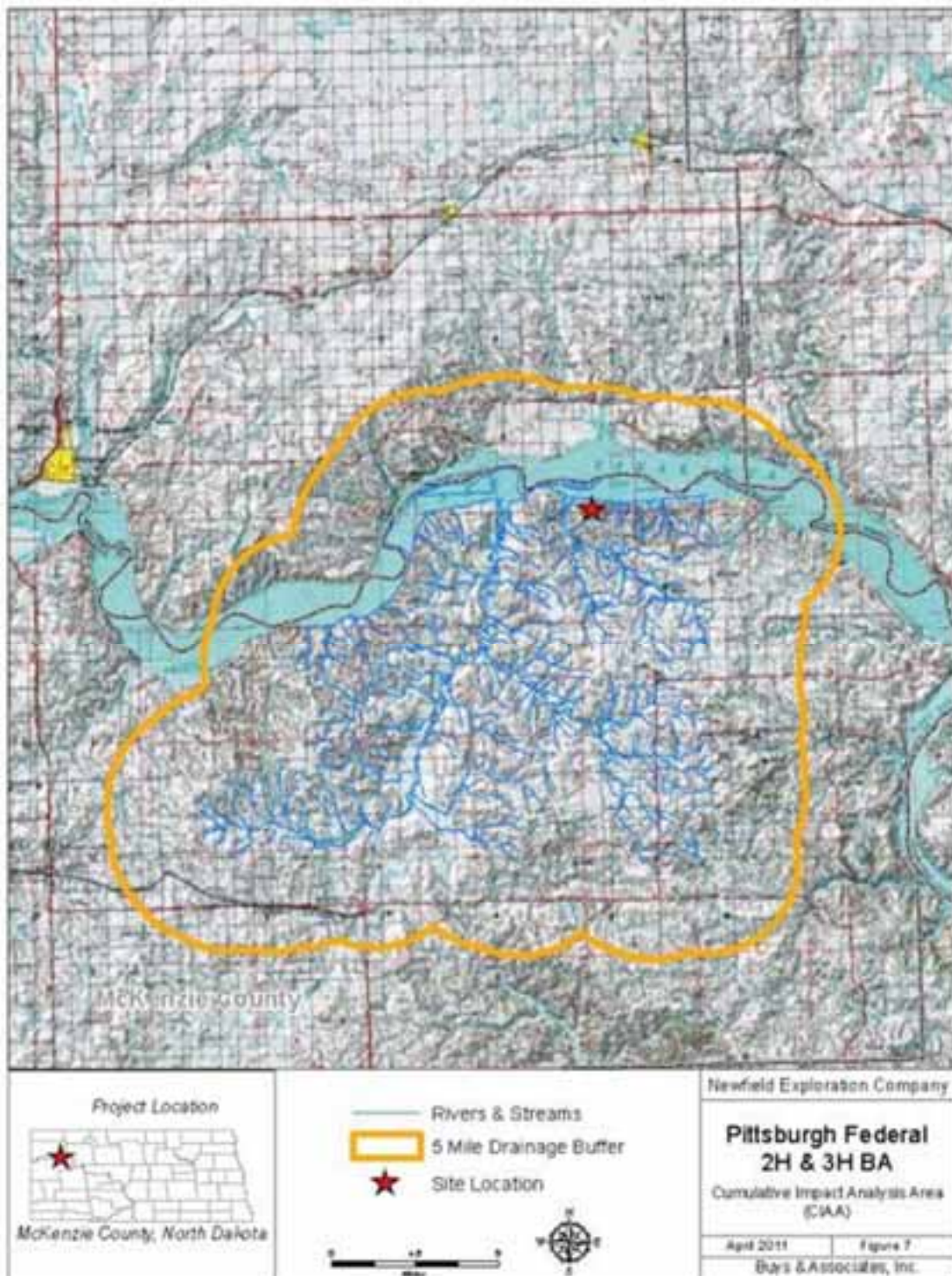








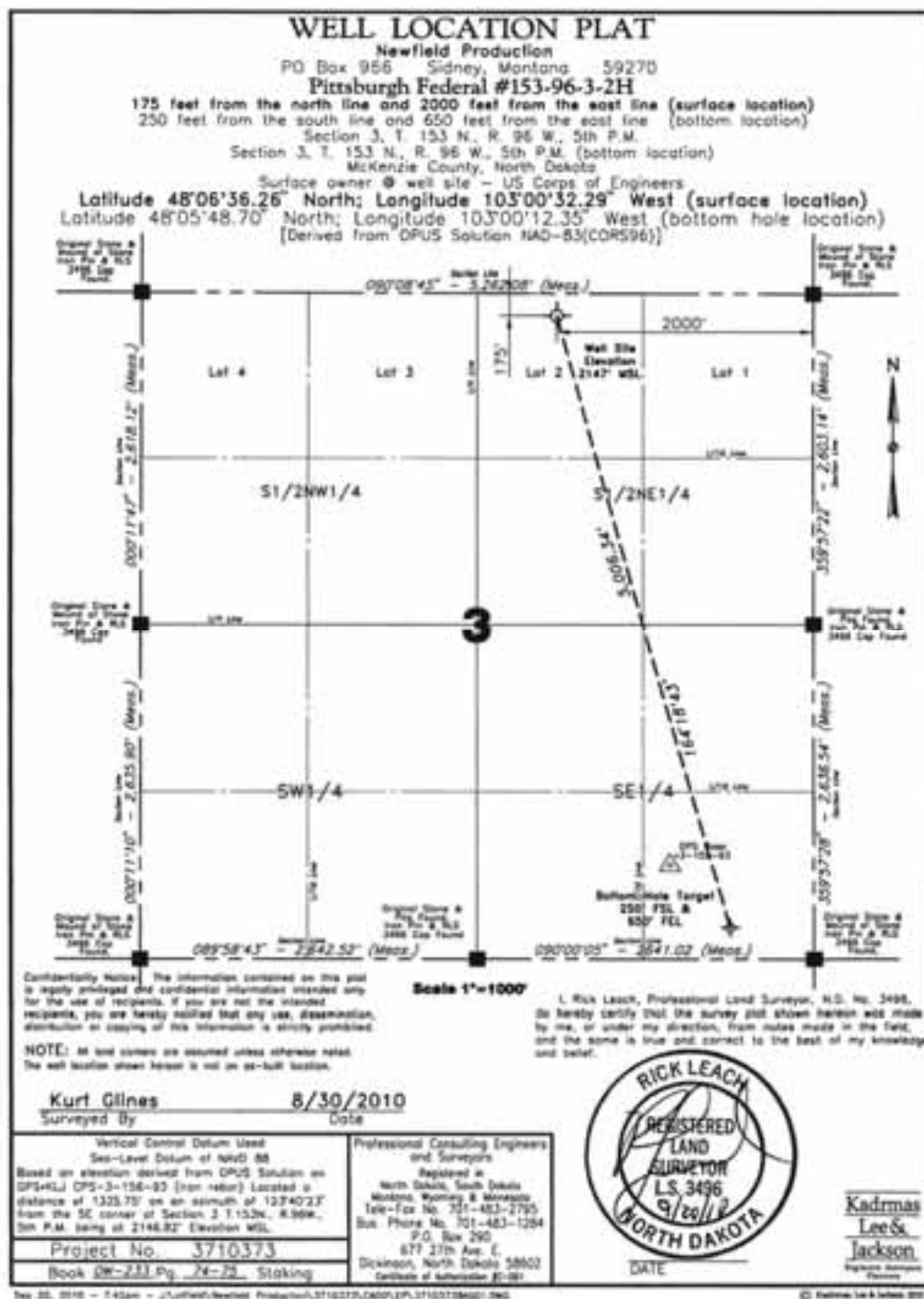


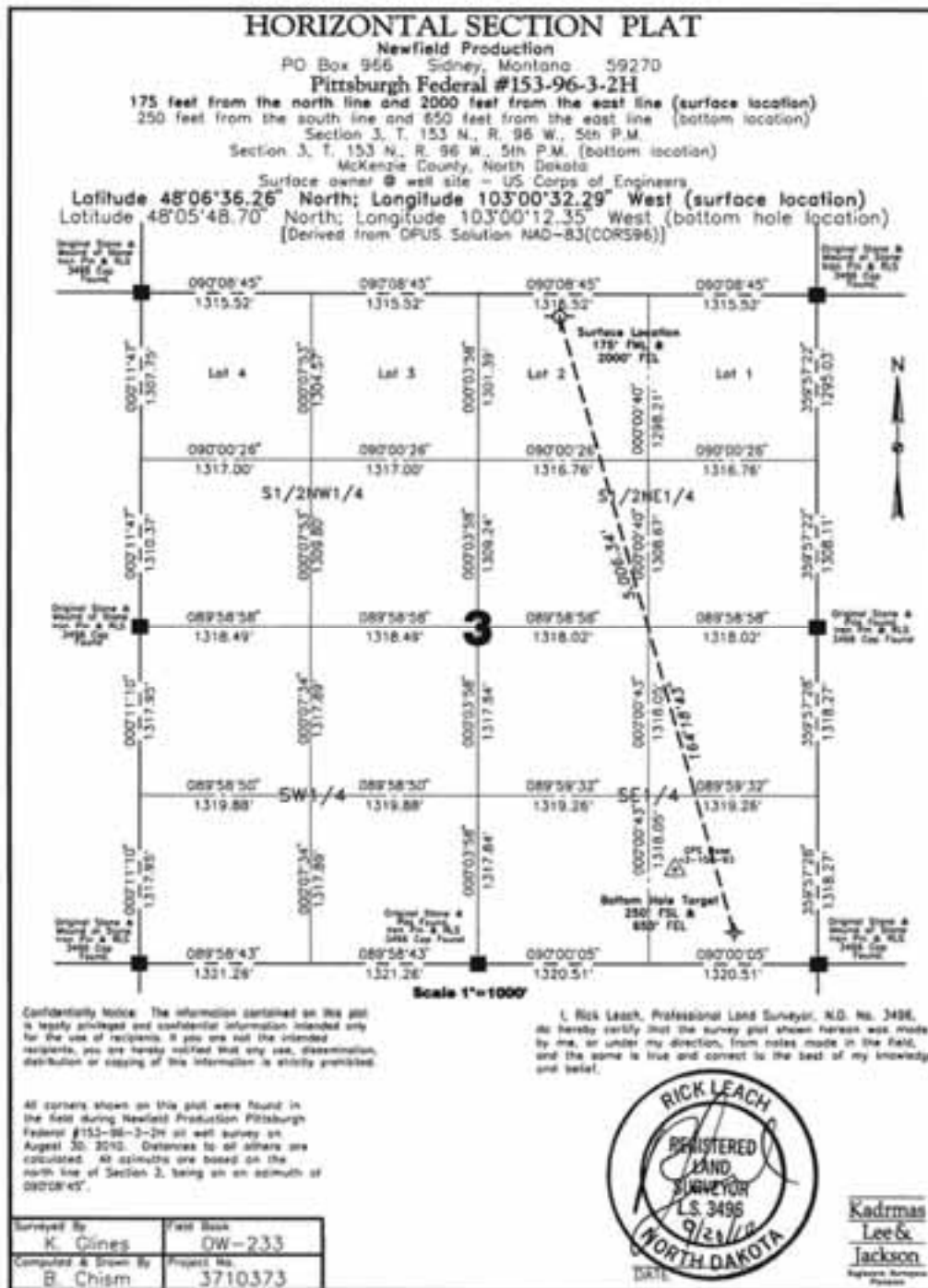


# Appendix B

## Survey Plats for Pittsburgh Federal 2H and 3H

## **Pittsburgh Federal #153-96-3-2H Oil Well Survey Plats**







**Newfield Production**  
**Pittsburgh Federal #153-96-3-2H & Pittsburgh Federal #153-96-3-3H**  
**Sec. 3, T. 153 N., R. 96 W., 5th P.M.**  
**McKenzie County, North Dakota**

(Pittsburgh Federal #153-96-3-2H) Well Site Elevation    2146.8' MSL  
(Pittsburgh Federal #153-96-3-3H) Well Site Elevation    2146.7' MSL  
Well Pad Elevation                    2144.8' MSL

Excavation	10,655 C.Y.
Embankment	5,465 C.Y.
Plus Shrinkage (+30%)	1,640 C.Y.
	7,105 C.Y.
 Stockpile Top Soil (6")	 2,880 C.Y.
Road Embankment from Pad or Stockpile with Pit	670 C.Y.
 Disturbed Area for Pad	 3.57 Acres

**NOTE :**  
All cut end slopes are designed at 1:1 slopes &  
all fill end slopes are designed at 1 1/2:1 slopes

Pittsburgh Federal #153-96-3-2H	Pittsburgh Federal #153-96-3-3H
<u>Well Site Location</u>	<u>Well Site Location</u>

175' FNL  
2000' FEL

175' FNL  
2075' FEL

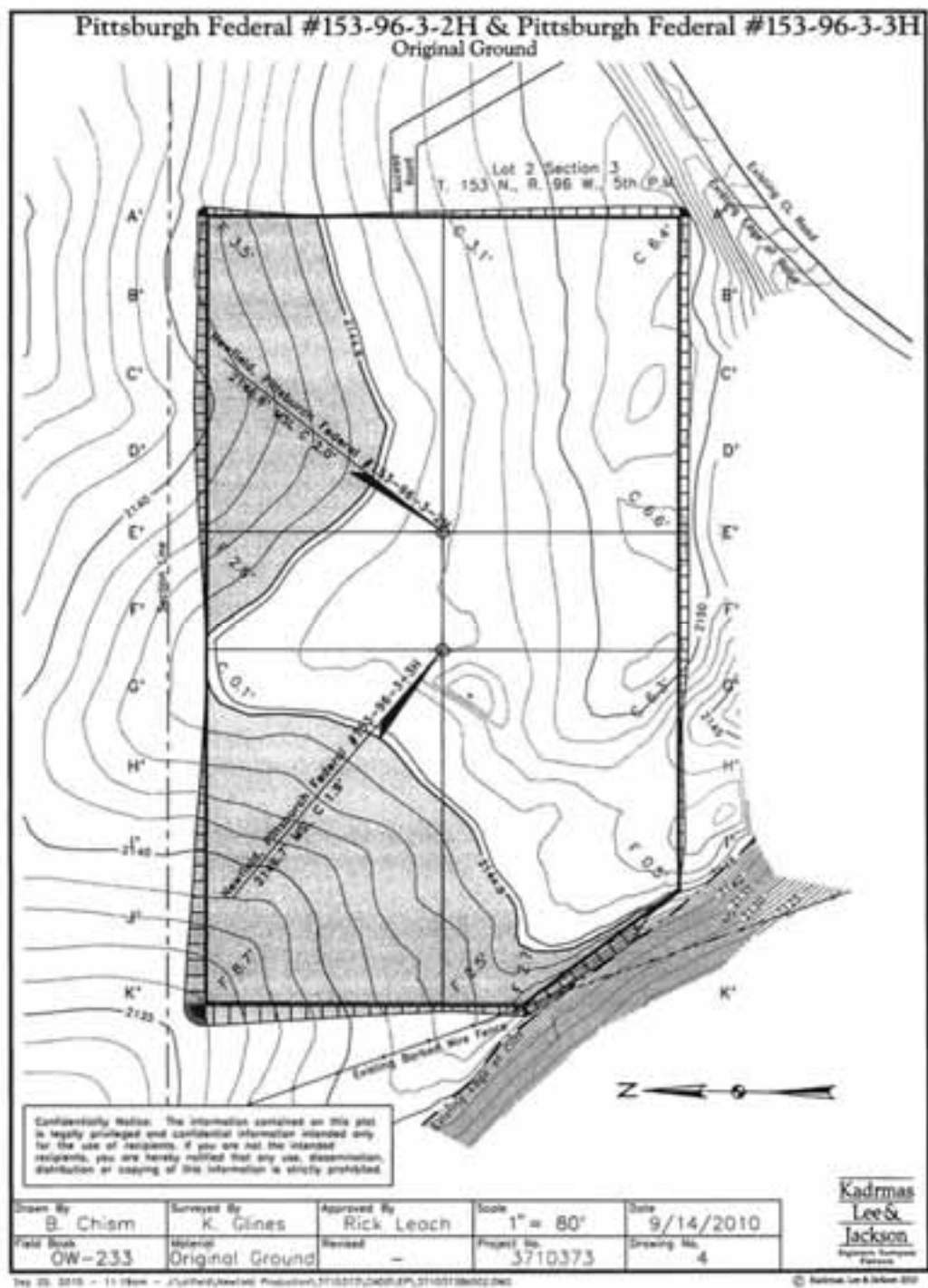
Confidentiality Notice:  
The information contained  
on this plat is legally  
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information intended only  
for the use of recipients.  
If you are not the  
intended recipient, you  
are hereby notified that  
any use, dissemination,  
distribution or copying of  
the information is strictly  
prohibited.

Drawn By B.Chism	Surveyed By K. Glines	Approved By Rick Leach	Scale None	Date 9/14/2010
Field Book OW-233	Material Quantities	Revised —	Project No. 3710373	Drawing No. 3

**Kadmas**  
**Lee &**  
**Jackson**  
Engineers, Surveyors  
Planners

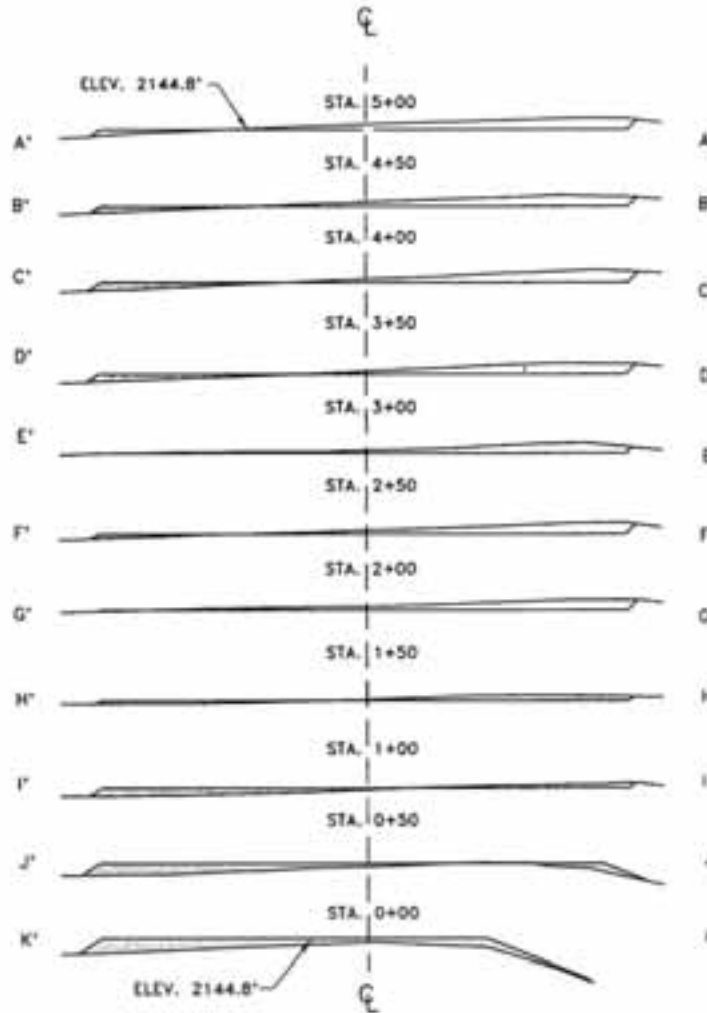
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**Pittsburgh Federal #153-96-3-3H & Pittsburgh Federal #153-96-3-2H**  
Cross Sections



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Drawn By B. Chism	Surveyed By K. Glines	Approved By Rick Leach	Scale 1" = 80'	Date 9/14/2010
Field Book OW-233	Material Cross Sections	Revised -	Project No. 3710373	Drawing No. 6

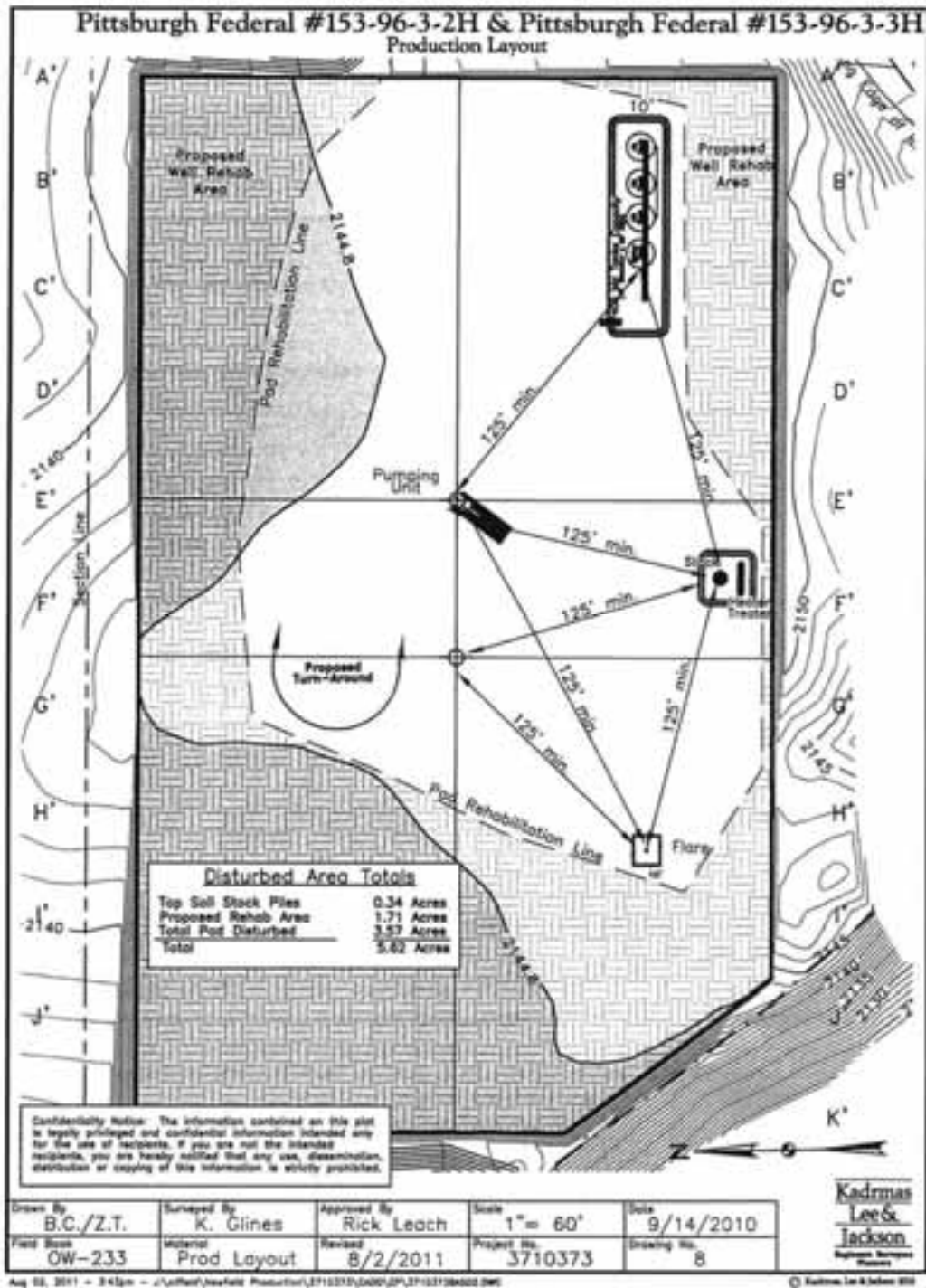
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Jackson**  
Surveyors & Engineers  
Pittsburgh, PA

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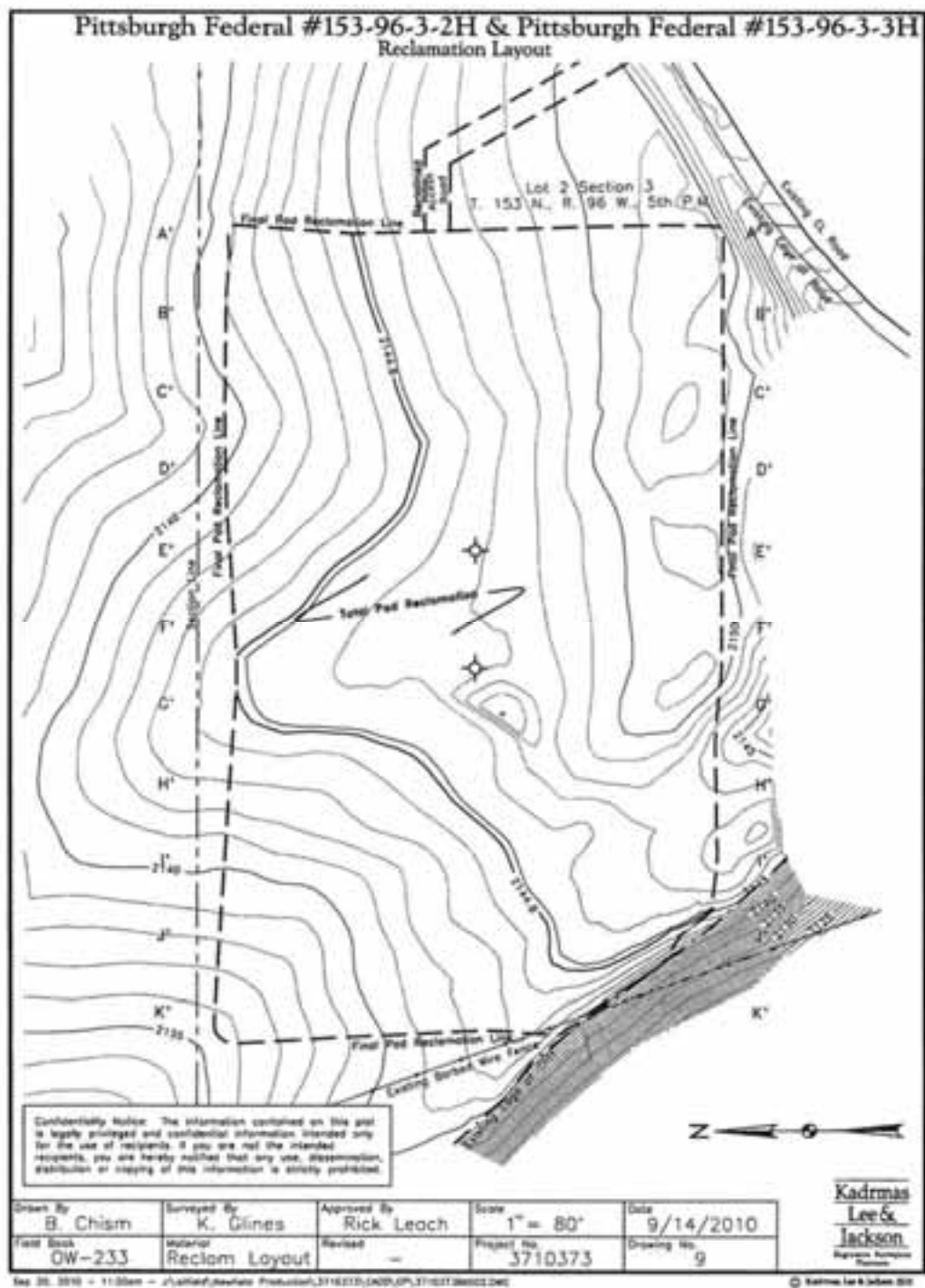
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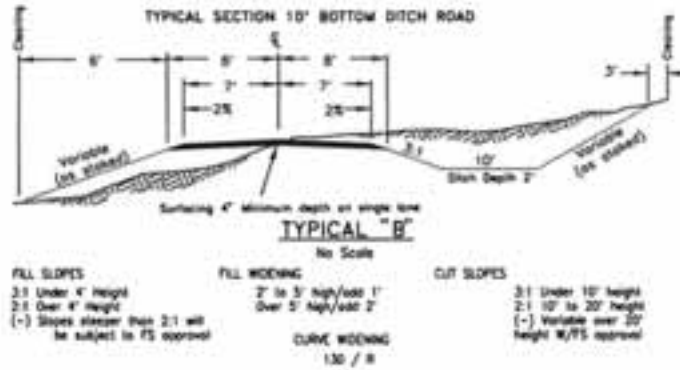




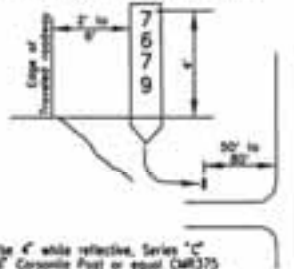




**Pittsburgh Federal #153-96-3-2H & Pittsburgh Federal #153-96-3-3H  
Roadway Typical Sections**

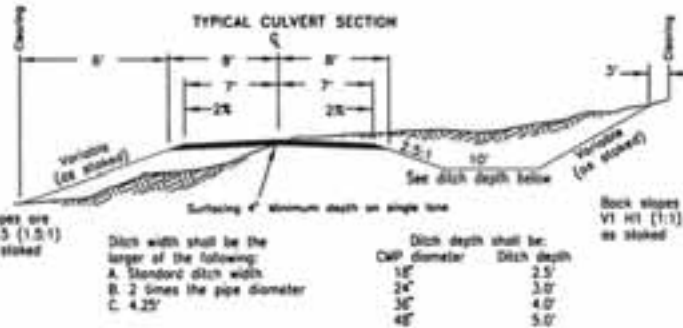
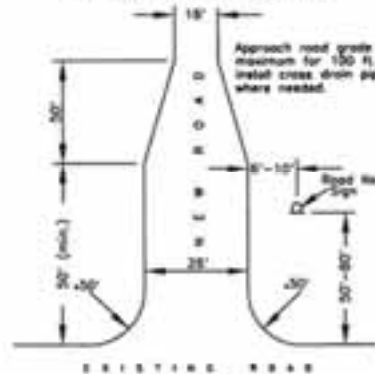


**TYPICAL SECTION VERTICAL ROUTE MARKER**



Letters shall be 4" wide reflective, Series "C" on Brown 5' 6" Corrosion Post or equal CM375  
Figure 11-28 - Typical Signage for Vertical Route Markers

**TYPICAL APPROACH ROAD CONNECTION**



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Drawn By <b>B.CHISM</b>	Surveyed By <b>K. Glines</b>	Approved By <b>Rick Leach</b>	Scale <b>None</b>	Date <b>9/14/2010</b>
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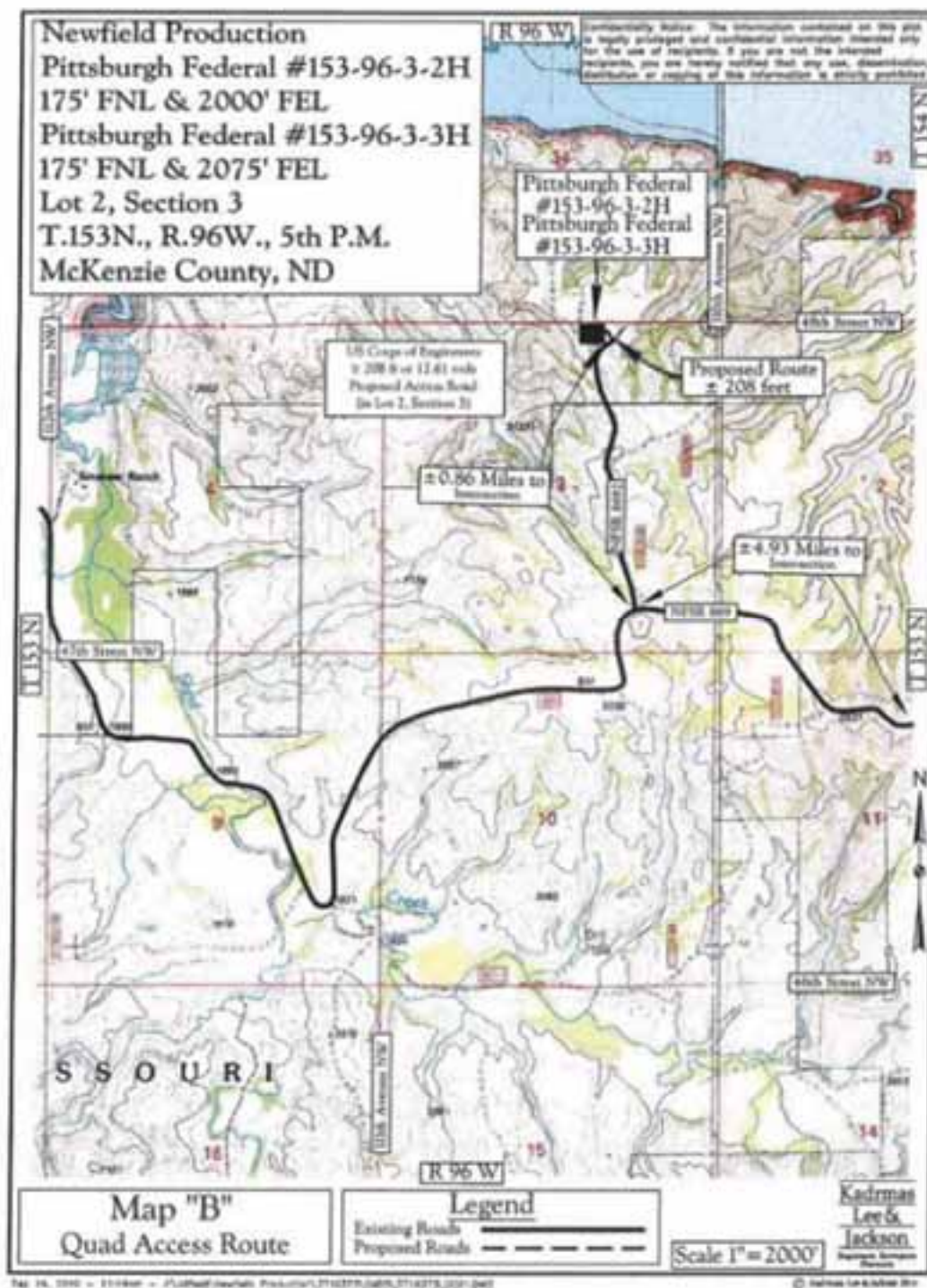
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Jackson**  
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## STATUS, WELL\_TYPE

● A, AGD	◇ DRL, GASC	● LOC, SWD
✂ A, AI	◇ DRL, OG	◇ LOC, WI
◇ A, CBM	◇ DRL, SWD	● PA, DF
✂ A, DF	◇ DRL, WI	● PA, GASC
✂ A, DFP	◇ DRY, GASC	● PA, GASD
◇ A, GASC	◇ DRY, GASD	● PA, GS
◇ A, GASD	◇ DRY, OG	● PA, OG
◇ A, GASN	◇ DRY, ST	● PA, SWD
● A, OG	◇ EXP, GASD	● PA, WI
△ A, SWD	● EXP, OG	● PA, WS
✂ A, WI	◇ EXP, SWD	⇒ PNC, GASD
✂ A, WS	✂ EXP, WS	⇒ PNC, OG
✂ A, AI	✂ IA, AI	⇒ PNC, SWD
✂ AB, AI	IA, CBM	× TA, AI
✂ AB, DF	✂ IA, DF	× TA, GASC
✂ AB, DFP	✂ IA, DFP	× TA, GASD
◇ AB, GASC	◇ IA, GASC	× TA, OG
◇ AB, GASD	◇ IA, GASD	× TA, SWD
✂ AB, GI	● IA, OG	× TA, WI
● AB, OG	△ IA, SWD	× TA, WS
△ AB, SWD	✂ IA, WI	× TAO, GI
✂ AB, WI	✂ IA, WS	× TAO, OG
✂ AB, WS	✂ IA, AI	× TAO, WI
◇ Confidential, Confidential	◇ LOC, GASC	

[illegible]

0101 = Red Sea Dragon, 011 = Air Support, 02 = Supply Front, 0201 = Supply Front Protection, 0202 = Winged Sea Wolf, 0203 = Sea Foxhound, 0204 = Sea Wyvern, 0205 = Sea Dragon, 03 = Sea Dragon, 04 = Sea Wolf, 0401 = Sea Wolf Dragon, 041 = Water Scorpion, 042 = Water Beetle, 05 = Water Beetle, 051 = Sea Wolf, 052 = Sea Wolf

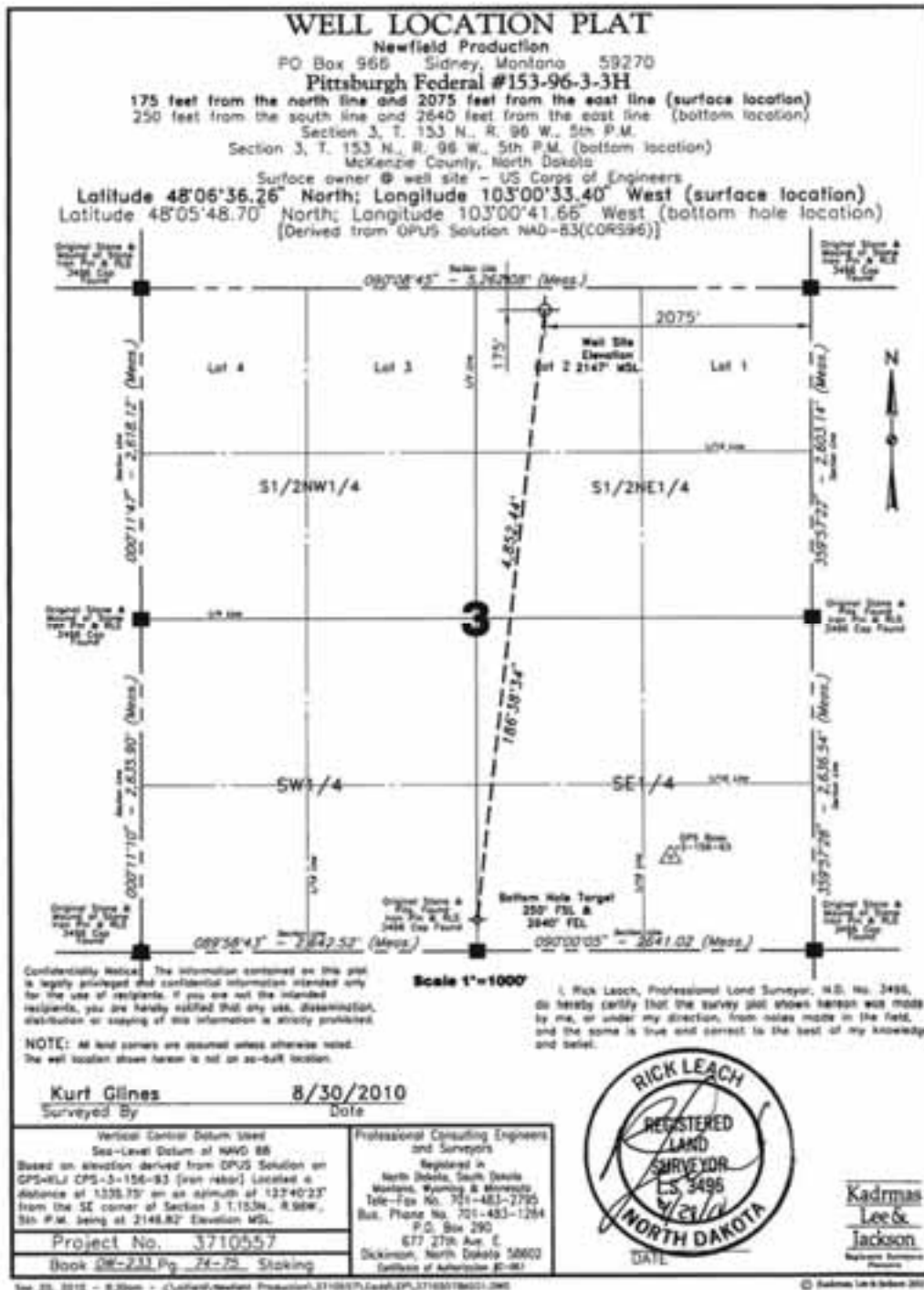
Exhibit "D"  
GIS Well Symbols

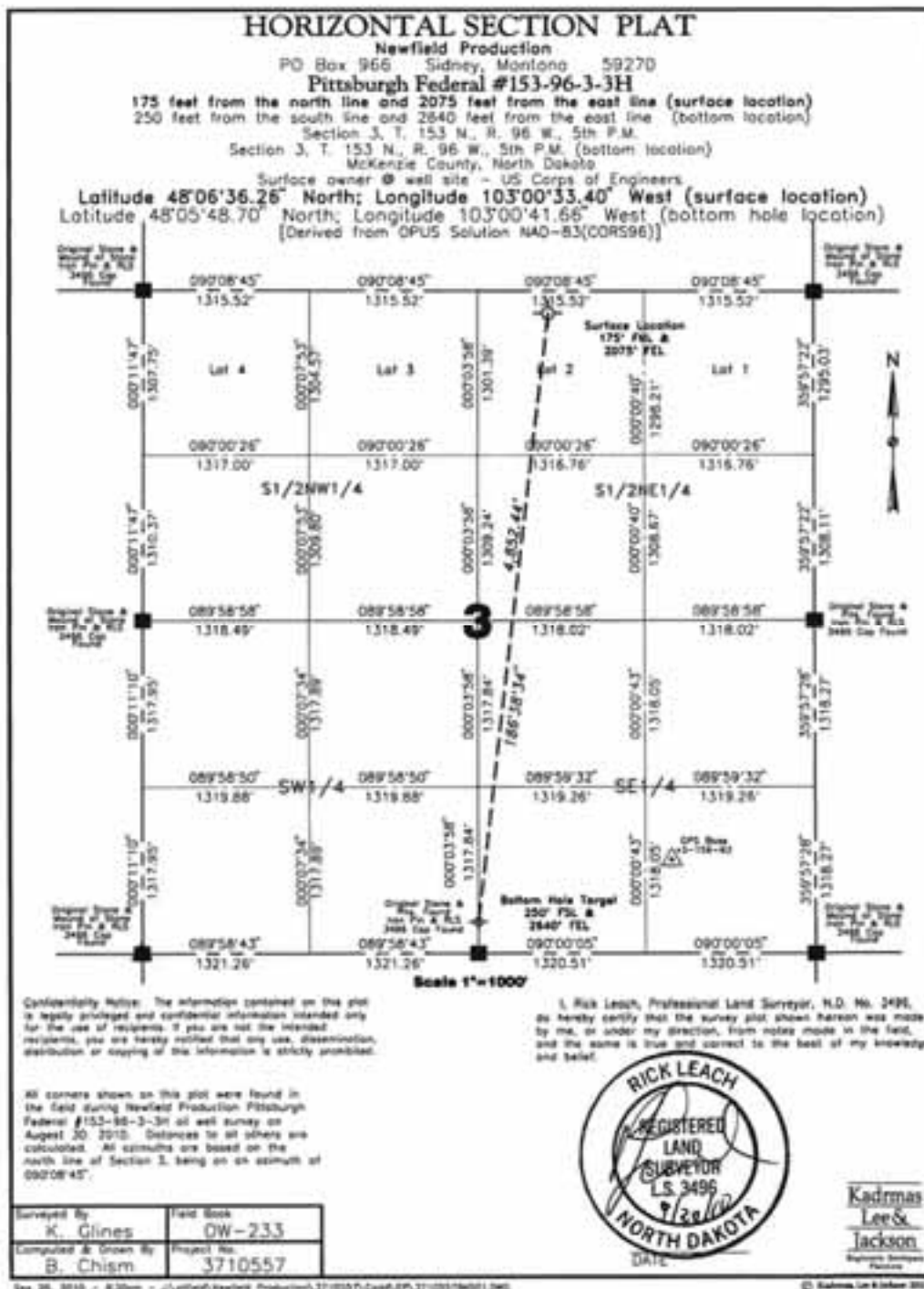






## **Pittsburgh Federal #153-96-3-3H Oil Well Survey Plats**





**Newfield Production**  
**Pittsburgh Federal #153-96-3-2H & Pittsburgh Federal #153-96-3-3H**  
**Sec. 3, T. 153 N., R. 96 W., 5th P.M.**  
**McKenzie County, North Dakota**

(Pittsburgh Federal #153-96-3-2H) Well Site Elevation    2146.8' MSL  
(Pittsburgh Federal #153-96-3-3H) Well Site Elevation    2146.7' MSL  
Well Pad Elevation    2144.8' MSL

Excavation    10,655 C.Y.

Embankment    5,465 C.Y.  
Plus Shrinkage (+30%)    1,640 C.Y.  


---

7,105 C.Y.

Stockpile Top Soil (6")    2,880 C.Y.

Road Embankment from Pad  
or Stockpile with Pit    670 C.Y.

Disturbed Area for Pad    3.57 Acres

**NOTE :**

All cut end slopes are designed at 1:1 slopes &  
all fill end slopes are designed at 1 1/2:1 slopes

**Pittsburgh Federal #153-96-3-2H**  
**Well Site Location**

175' FNL  
2000' FEL

**Pittsburgh Federal #153-96-3-3H**  
**Well Site Location**

175' FNL  
2075' FEL

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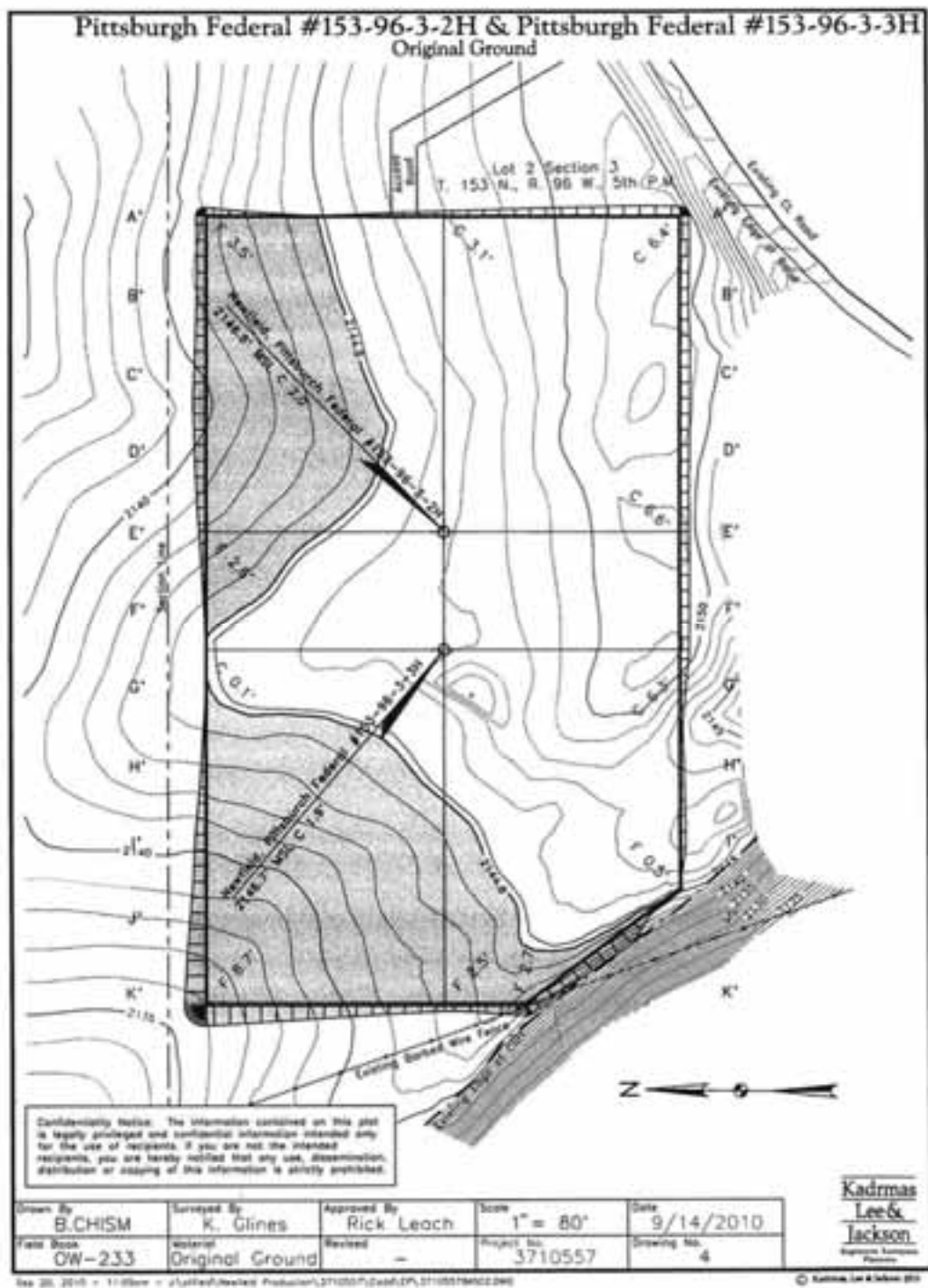
Drawn By B. Chism	Surveyed By K. Glines	Approved By Rick Leach	Scale None	Date 9/14/2010
Field Book OW-233	Motors Quantities	Revised —	Project No. 3710557	Drawing No. 3

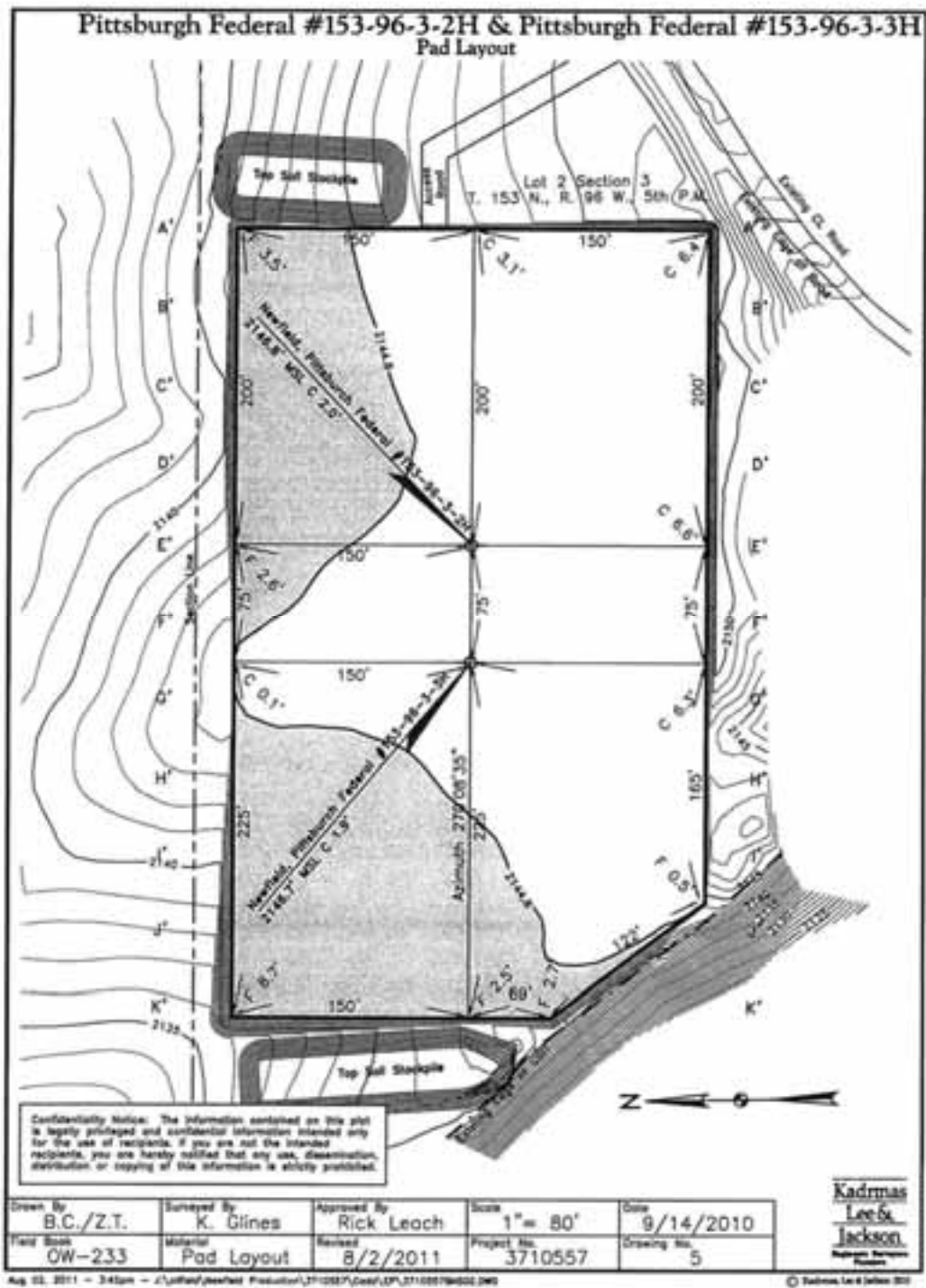
**Kadmas**  
**Lee &**  
**Jackson**  
Engineers, Surveyors  
Planners

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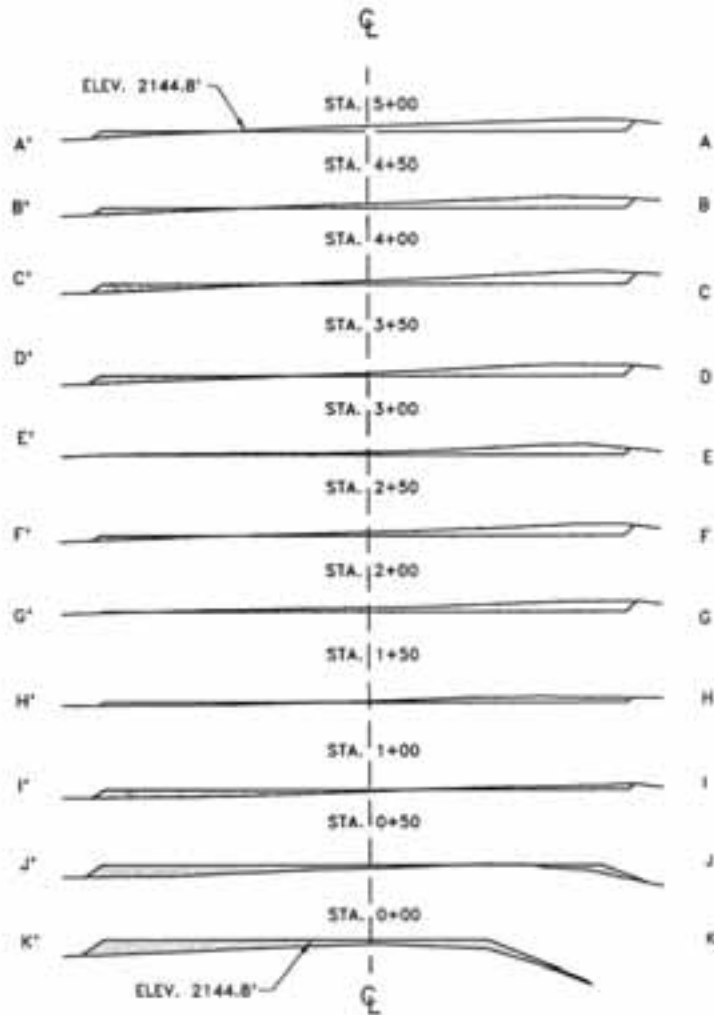
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**Pittsburgh Federal #153-96-3-3H & Pittsburgh Federal #153-96-3-2H**  
Cross Sections



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Drawn By <b>B.CHISM</b>	Surveyed By <b>K. Glines</b>	Approved By <b>Rick Leach</b>	Scale <b>1" = 80'</b>	Date <b>9/14/2010</b>
Field Book <b>OW-233</b>	Material <b>Cross Sections</b>	Revised <b>-</b>	Project No. <b>3710557</b>	Sheet No. <b>6</b>

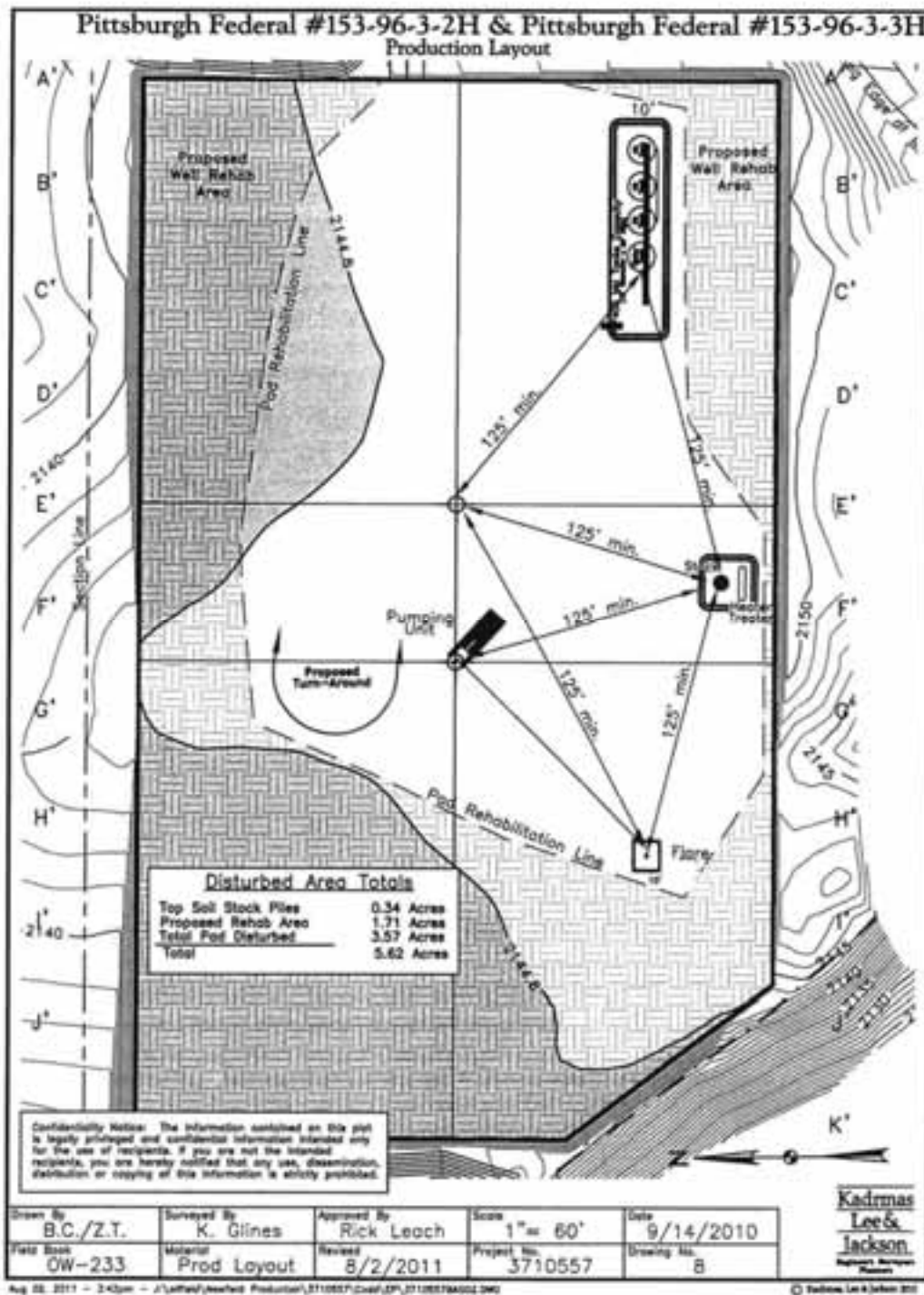
**Kadmas**  
**Lee &**  
**Jackson**  
Engineers Surveyors  
Planners

Sup. 001, 0010 - 11-05-00 - J:\0010\New\001 - Production\3710557\Cross\CP\3710557\00102.DWG

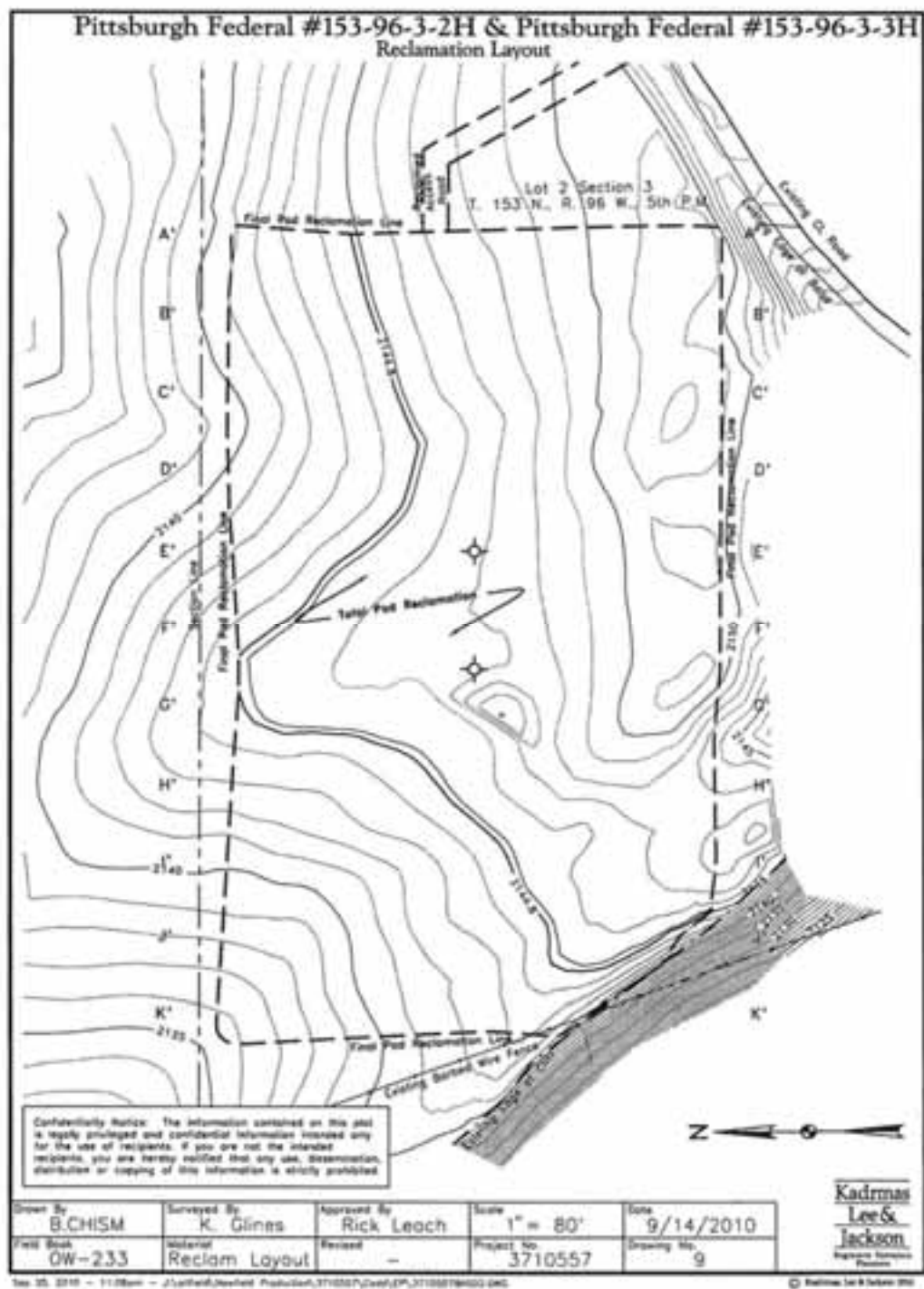
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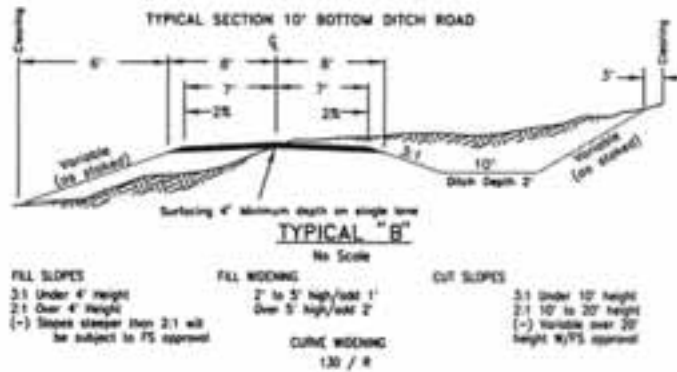




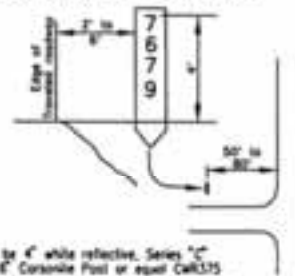




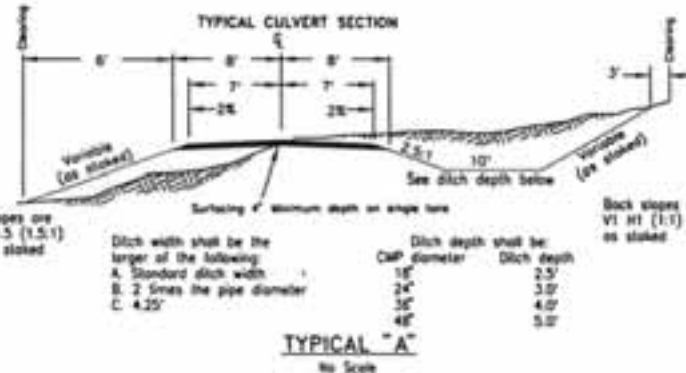
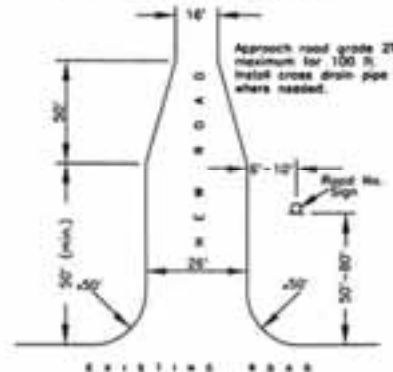
**Pittsburgh Federal #153-96-3-2H & Pittsburgh Federal #153-96-3-3H**  
**Roadway Typical Sections**



**TYPICAL SECTION VERTICAL ROUTE MARKER**



**TYPICAL APPROACH ROAD CONNECTION**



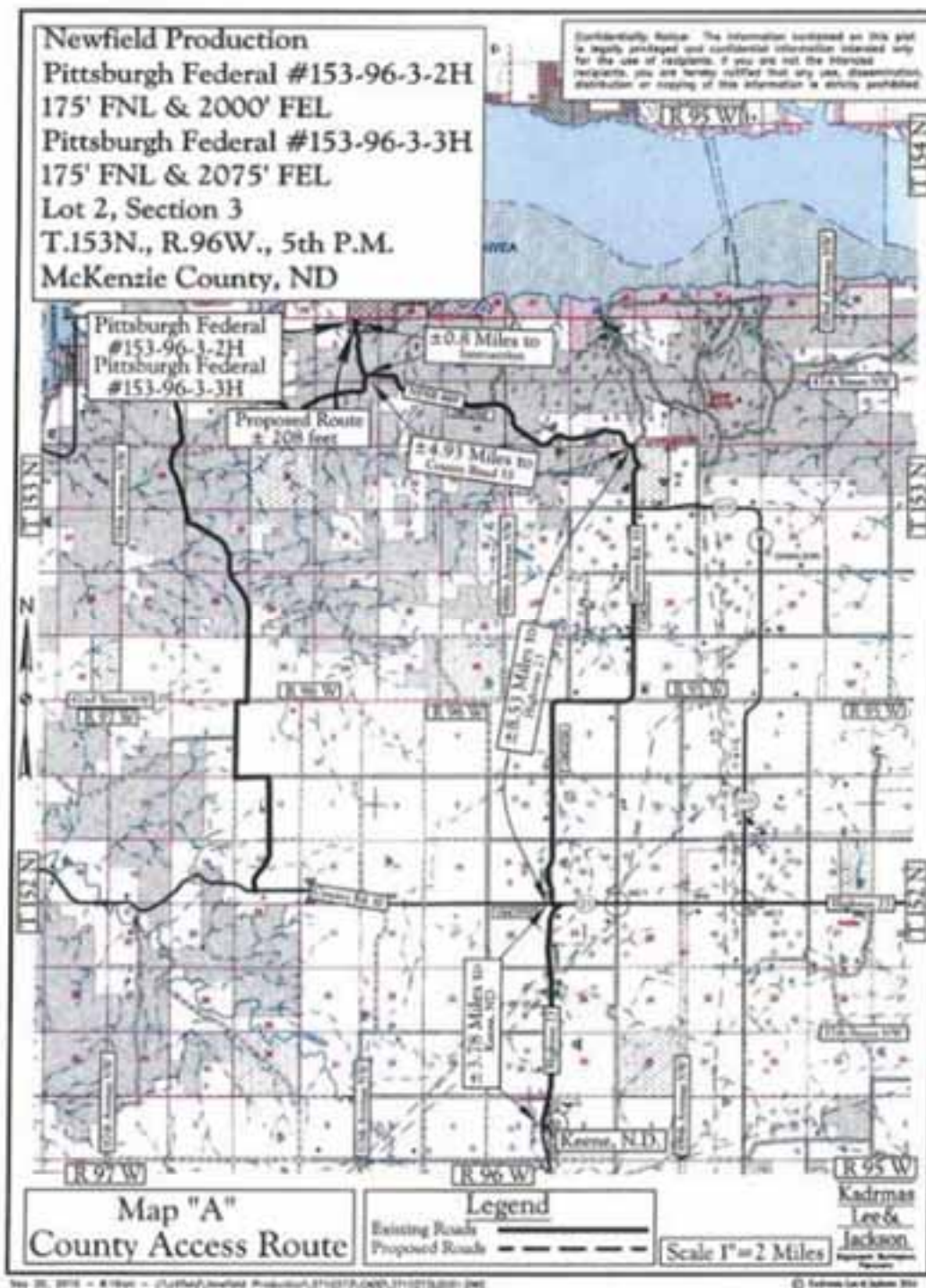
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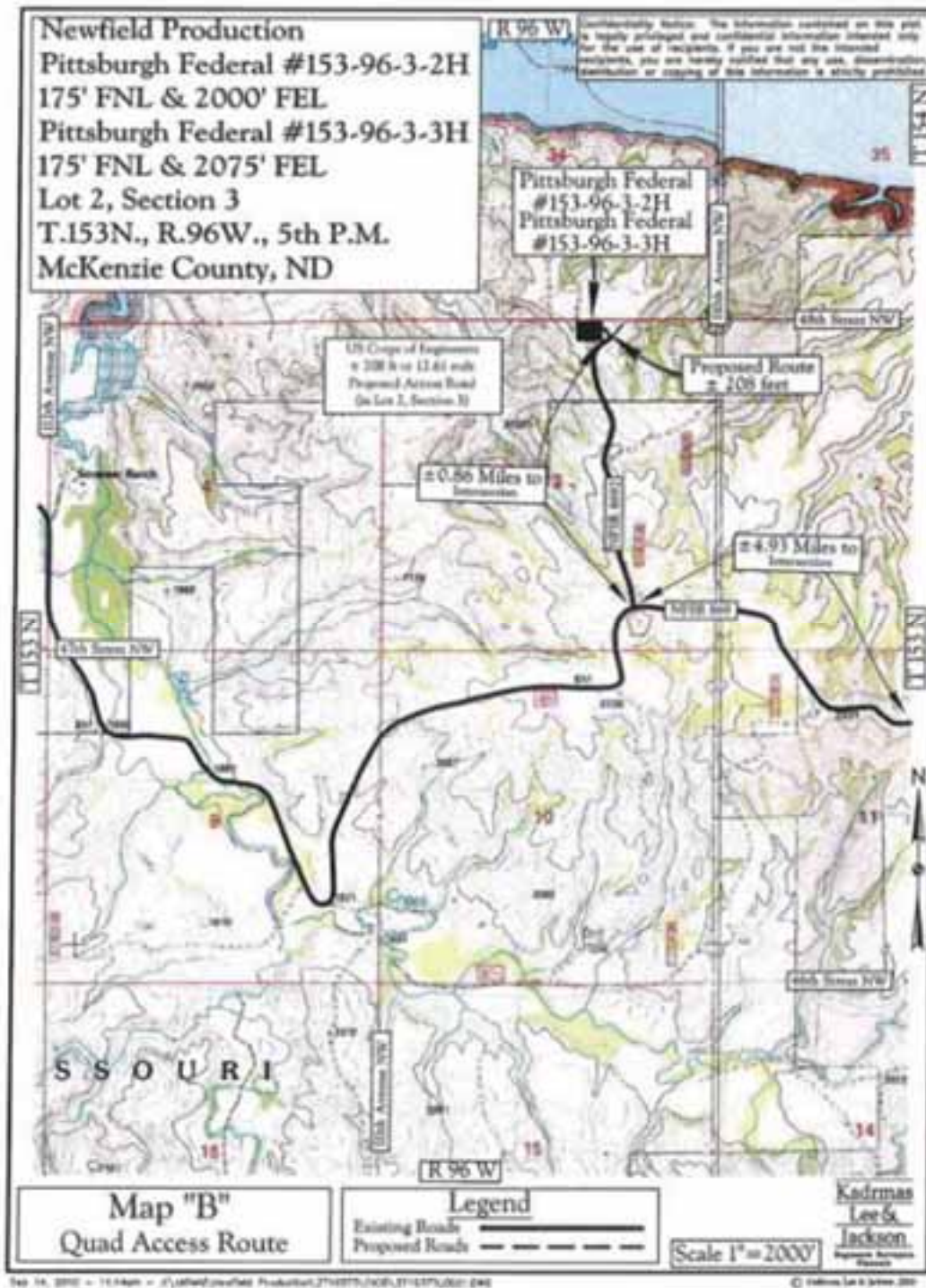
**Kadman**  
**Lee &**  
**Jackson**  
 Planning Engineers  
 Realtors

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## Legend

### wells

#### STATUS, WELL\_TYPE

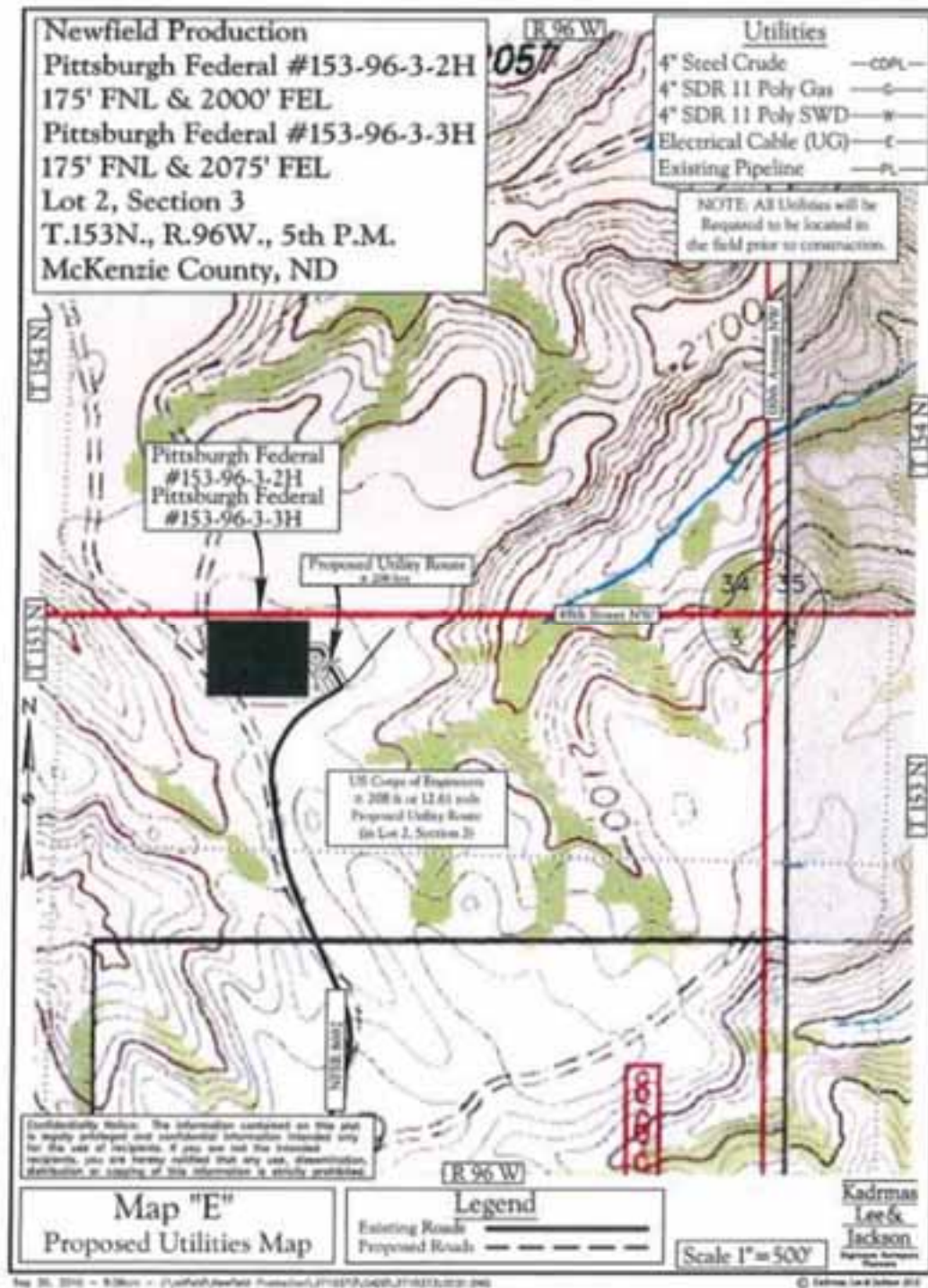
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✂ A, AI	○ DRL, GASC	○ LOC, OG
□ A, CBM	○ DRL, GASD	○ LOC, SWD
✂ A, DF	○ DRL, OG	○ LOC, WI
✂ A, DFP	○ DRL, SWD	✱ PA, DF
○ A, GASC	○ DRL, WI	✱ PA, GASC
○ A, GASD	◇ DRY, GASC	✱ PA, GASD
○ A, GASH	◇ DRY, GASD	✱ PA, GS
● A, OG	◇ DRY, OG	✱ PA, OG
△ A, SWD	◇ DRY, ST	✱ PA, SWD
✂ A, WI	○ EXP, GASD	✱ PA, WI
✂ A, WS	✱ EXP, OG	✱ PA, WS
✂ A, AI	○ EXP, SWD	⇒ PNC, GASD
✂ AB, AI	✂ EXP, WS	⇒ PNC, OG
✂ AB, DF	✂ IA, AI	⇒ PNC, SWD
✂ AB, DFP	IA, CBM	✱ TA, AI
○ AB, GASC	✂ IA, DF	✱ TA, GASC
○ AB, GASD	✂ IA, DFP	✱ TA, GASD
✂ AB, GI	○ IA, GASC	✱ TA, OG
● AB, OG	○ IA, GASD	✱ TA, SWD
△ AB, SWD	● IA, OG	✱ TA, WI
✂ AB, WI	△ IA, SWD	✱ TA, WS
✂ AB, WS	✂ IA, WI	✱ TAO, GI
Confidential, Confidential	✂ IA, WS	✱ TAO, OG
	✂ IA, AI	✱ TAO, WI
	○ LOC, GASD	

● = Active AB = Abandoned BBS = Boring Box = Box CDP = Closed CA = Casing LDC = Location RA = Pattern Reassigned PNC = Packed Non-Consolidated  
Ta = Temporary Abandoned TSD = Temporary Abandoned Non-Consolidated

AGD = Air/Gas Drifted AI = Air Injection DF = Flow Drift DFP = Flow Drift/Pumping GASD = Gas/Gas Drift GASC = Gas/Gas Drift GASD = Gas Drift  
GS = Gas/Gas Drift GI = Gas/Gas Drift OG = Oil/Gas Drift SWD = Salt Water Drift WI = Water Injection WS = Water Drift ST = Salt Drift

Exhibit "D"  
GIS Well Symbols





# Appendix C

## The Gold Book Chapter 4: Construction & Maintenance

# Chapter 4 – Construction and Maintenance

This chapter provides guidance for the operator about the basic requirements for safe and environmentally sound construction and maintenance of oil and gas-related infrastructure. Construction and maintenance must be performed to standards that ensure the long-term health and productivity of the land. The operator's representative must ensure compliance with all plans and designs. The representative should be designated prior to construction; be accessible to the surface

management agency authorized officer; have immediate access to an approved copy of the Application for Permit to Drill (APD), including all maps, drawings, templates, and construction standards; and have the authority to make changes at the request or order of the BLM or surface management agency.

## Well Sites

### Site Selection and Design

To the extent permitted by the geologic target, well spacing, and drilling and production technology, the locations selected for well sites, tank batteries, pits, and compressor stations should be planned so as to minimize long-term disruption of the surface resources and existing uses, and to promote successful reclamation. Design and construction techniques and other practices should be employed that would minimize surface disturbance and the associated effects of proposed operations and maintain the reclamation potential of the site. The following guidelines can be used to assist in meeting these objectives and reducing the overall undesirable impacts from well sites and other construction areas.

Well sites should be designed to fit the landscape and minimize construction needs. In many cases, this means designing a well site that has an irregular shape, not rectangular. The site layout should be located and staked in the most level area, off narrow ridges, and set back from steep slopes, while taking into consideration the geologic target, technical, economic, and operational feasibility, spacing rules, natural resource concerns, and safety considerations. Well locations constructed on steep slopes cost more to construct, maintain, and reclaim and result in greater resource impacts. Locations on steep slopes that require deep, nearly vertical cuts and steep fill slopes should be avoided where possible or appropriately mitigated. Operations should also be

avoided or properly mitigated in riparian areas, floodplains, playas, lakeshores, wetlands, and areas subject to severe erosion and mass soil movement. In visually sensitive areas, locations should be selected that provide for vegetative and topographic screening. The well site or production facility location should also be reviewed to determine its effect on the location of the access road. The advantages gained by a good well site or tank battery location should not be negated by the adverse effects of the access road location.

## Construction

Construction procedures must conform to the approved Surface Use Plan of Operations. In order to minimize surface disturbance, construction equipment appropriately sized to the scope and scale of the proposed operation should be used. All surface soil materials (topsoil) are to be removed from the entire cut and fill area and temporarily stockpiled for reuse during interim reclamation or final reclamation if the well is a dry hole. The depth of topsoil to be removed and stockpiled should be determined at the onsite inspection and should be stated either in the proposed Surface Use Plan of Operations or specified in the APD conditions of approval.

Topsoil should be segregated and stored separately from subsurface materials to avoid mixing during construction, storage, and interim reclamation. Subsurface materials should never be placed on top of topsoil material at any point in the operation. Stockpiles should be located and protected so that wind and water erosion are minimized and reclamation potential is maximized.

Excavation of the cut and fill slopes is normally guided by information on the slope stakes. Fills should be compacted to minimize the chance of subsidence or slope failure. If excess cut material exists after fill areas have been brought to grade, the excess material will be stockpiled at approved locations. Snow and frozen soil material is not to be used in construction of fill areas, dikes, or berms. To reduce areas of soil disturbance, the surface management agency may allow mowing or brush beating of vegetation for parts of the well location or access road where excavation is not necessary.

The area of the well pad where the drilling rig substructure is located should be level and capable of supporting the rig. The drill rig, tanks, heater-treater, and other production equipment are not to be placed on uncompacted fill material. The area used for mud tanks, generators, mud storage, and fuel tanks should be at a slight slope, where possible, or a suitable alternative, such as ditching, should be used to provide surface drainage from the work area to the pit.

To reduce erosion and soil loss, it may be appropriate to divert storm water away from the well location with ditches, berms, or waterbars above the cut slopes and to trap well location runoff and sediments on or near the location through the use of sediment fences or water retention ponds.

## Reserve Pits

Reserve pits are generally used for storage or disposal of water, drill mud, and cuttings during



drilling operations. The pit should normally be located entirely in cut material. Avoid constructing reserve pits in areas of shallow groundwater. Reserve pits should not be constructed in natural watercourses. Water courses include lake beds, gullies, draws, streambeds, washes, arroyos, or channels that are delineated on a 1:24,000 USGS quadrangle map or have a hydrologic connection to streams, rivers, or lakes.

For reserve pit construction on sloping sites, the preferred method is to locate the pit on the drill pad next to the high wall. Pits are constructed totally in cut at such locations. If this is not possible, at least 50 percent of the reserve pit should be constructed below original ground level to help prevent failure of the pit dike. Fill dikes should be properly compacted in lifts. The necessary degree of compaction depends on soil texture and moisture content. The pit should be designed to contain all anticipated drilling muds, cuttings, fracture fluids, and precipitation while maintaining at least 2 feet of freeboard.

Pits improperly constructed on slopes or poor soil types may leak along the plane between the natural ground level and the fill. There is a significant potential for pit failure in these situations. When constructing dikes for pits or impoundments with fill embankment, a keyway or core trench should be excavated to a minimum depth of 2 to 3 feet below the original ground level. The core of the embankment can then be constructed with compacted, water-impervious material.

To prevent contamination of ground water and soils or to conserve water, it is recommended that operators use a closed-loop drilling system or line reserve pits with an impermeable liner, particularly when it is anticipated that pits will contain moderate or high levels of hydrocarbons and chloride, or the pits are located in areas of shallow groundwater or porous soils over fractured bedrock aquifers.

Pits can be lined with synthetic liners or other materials such as bentonite or clay. Impermeable liners should have a permeability of less than  $10^{-7}$  cm/sec. Liners must be installed so that they will not leak and must be composed of materials compatible with all substances to be placed in the pit. Synthetic liners with a minimum thickness of 12 mils and resistance to ultraviolet radiation, weathering, chemicals, punctures, and tearing are most commonly used, although some States may require liners that are thicker. Suitable bedding material, such as sand, clay, or felt liners should be used in areas where the base rock might puncture the liner.

Depending on the proposed contents of the pit and sensitivity of the environment, the surface management agency may require a leak detection system or the use of self-contained mud systems with the drilling fluids, mud, and cuttings being transported to approved disposal areas.

Reserve pits should be appropriately fenced to prevent access by persons, wildlife, or livestock. During drilling in active livestock areas, the reserve pit must be fenced with an enclosure fence on three sides and then fenced on the fourth side once drilling has been completed. Refer to Figure 1 for recommended fence construction standards in active livestock areas. In areas where livestock will not be present, other types of fences may be appropriate.

The fence should remain in place until pit reclamation begins. After cessation of drilling and completion operations, any visible or measurable layer of oil must be removed from the surface of the reserve pit and the pit kept free of oil. In some situations and locations, precautions, such as

netting, may be required in order to prevent access and mortality of birds and other animals.

## Roads and Access Ways

This section provides the minimum guidelines for oil and gas operators on BLM and FS policy and standards relative to the planning, location, design, construction, maintenance, and operation of roads and access ways on public and National Forest System lands. Contact the local BLM or FS office for specific requirements. Exception to or modification of these guidelines is at the surface management agency's discretion based on the physical conditions at the site and the project proposal. Figure 2 illustrates commonly used terms in road design and should be referred to when reviewing this section.

To ensure public safety and the protection of Federal resources, BLM and FS roads must be constructed to an appropriate standard no higher than necessary to accommodate the intended use. In many cases, the construction of a lower-class road will meet the operator's access needs, while minimizing the effects on other important resource values.

Roads used to access oil and gas locations are typically constructed for that primary purpose, are rarely permanent, and exist only as long as necessary to complete exploration and production operations. They are authorized with an accompanying reclamation plan and are to be reclaimed after well and field operations are completed. In relatively rare cases, the surface management agency or surface owner may assume responsibility for the continued operation and maintenance of roads deemed necessary.

The authorized officer has the option of determining whether professional engineering design and construction oversight is necessary or whether the road can be constructed by the operator consistent with site-specific standards and approved road design templates (Figures 2 and 3). The need for professional engineering design and oversight should be based on factors such as topography, soils, hydrology, safety, and levels and types of use by the operator and general public. For oil and gas roads on National Forest System lands, a qualified FS engineer reviews all project design drawings, officially attesting to their technical adequacy.

To meet the requirements of Onshore Order No. 1 (Surface Use Plan of Operations, 2a and b) for new or reconstructed roads, the operator must provide information such as:

- Road width, maximum grade, and crown design
- Location of turnouts



# Transportation Planning

The goal of transportation planning is to identify and analyze feasible alternatives for access that meet the objectives of the surface management agency, private surface owner, and the needs of the diverse users of Federal lands. The transportation planning process:

- Considers future road use needs, including public access and resource development or use
- Considers affected resource values and safety
- Avoids haphazard or unnecessary development of roads and utility corridors

Road location and design criteria are also developed and documented during the transportation planning process. Transportation planning can prevent unnecessary expenditures of time and money and prevent unnecessary surface disturbance. Therefore, it is important for the operator to become involved in the transportation planning process.

## Road Location

Road location is critical to the long-term maintenance and environmental success of a road construction project. Proper road location can significantly reduce or eliminate impacts to cultural, scenic, biological, and other environmental resources. Operators are strongly encouraged to contact the surface management agency or private surface owner about possible route locations before surveying and staking. This early communication between the operator and the surface management agency or private surface owner can minimize changes made at the onsite inspection and reduce project delays.

Existing roads should be considered for use as access routes and may be used when they meet agency standards, transportation and development needs, and environmental objectives. When access involves the use of existing agency roads, operators must obtain agency approval and may be required to upgrade the roads, contribute to road maintenance funds, or participate in road maintenance agreements.

When selecting a location for new roads, consider following topographic contours. While laying out roads in a point-to-point approach minimizes the length of road, it often increases soil erosion, maintenance costs, long-term loss of vegetation, and visual contrast. Following natural topographic

contours preserves natural drainage patterns and usually makes it possible to design a more aesthetically pleasing road with lower construction, maintenance, and reclamation costs and less impact on the environment.

Initial steps in road location include:

- Determination of the intended use of the road, planned season of use, type of vehicles to be used, road class, and needs of the surface owner or agency
- Examination of the surface management agency's transportation plan, which may already have identified feasible routes for the area
- Examination of existing data, including maps and aerial photos, land use plan decisions, and biological, physical, and cultural conditions of the area
- Determination of oil and gas lease obligations, future development needs, and safety considerations.

Once these steps have been taken, an appropriate route can be identified. This process is critical to ensuring that the safest and least intrusive route is chosen.

### Geotechnical Factors

In complex terrain or conditions, it is recommended that the operator look at various route alternatives before selecting the preferred route. Field reconnaissance of alternative routes may be necessary in order to provide information on such factors as soil types, construction/reclamation limitations, type of excavation, landslide areas, subgrade conditions indicating the need for surfacing, potential cut slope problems, surface or subsurface water problem areas, suitability of fill material, potential gravel pits or quarries for road aggregate, and potential borrow and waste sites. A good road location analysis may avoid costly problems and identify cost-saving opportunities.

### Other Factors

Other factors to consider that are unique to the oil and gas industry include:

- The potential for encountering sour gas (H<sub>2</sub>S). Note the prevailing wind direction and identify a



clear escape route from the drill site.

- ⁿ The potential for year-round operation. Drill sites and producing locations may require all-weather access and special maintenance considerations for snow removal.
- ⁿ The potential for exploratory drilling to result in a producing operation. Select initial road alignments and road classes based on the potential for upgrade if the wells are completed for production.

When the road location information is submitted to the surface management agency, the acceptability of the proposed route, and if applicable, alternative routes, can be evaluated. The preferred road location will be identified by the authorized officer at the onsite inspection in coordination with the private surface owner on non-Federal surface.

## Road Design and Construction

### Construction and Reclamation Considerations

New road construction or reconstruction by the operator must be suitable for the intended use and must comply with BLM road and safety standards, such as those found in BLM's 9113–Roads Manual. Roads constructed within the jurisdiction of the FS must comply with applicable FS road and safety standards.

Roads should be designed and constructed to allow for successful interim and eventual final reclamation. Revegetation of road ditches and cut and fill slopes will help stabilize exposed soils and reduce sediment loss, reduce the growth of noxious weeds, reduce maintenance costs, maintain scenic quality and forage, and protect habitat. To ensure successful growth of plants and forbs, topsoil must be salvaged where available during road construction and respread to the greatest degree practical on cut slopes, fill slopes, and borrow ditches prior to seeding. To ensure the stability of freshly topsoiled slopes during revegetation, the application of mulch or other sediment control measures may be appropriate.

Construction with saturated or frozen soils results in unstable roads and should be avoided. Vehicular travel under wet conditions can produce significant rutting of unsurfaced roads resulting in soil loss and safety concerns. If road use is anticipated during saturated soil conditions, the surface management agency may require road surfacing to provide safe vehicle access, ensure uninterrupted operations, and reduce road damage and sediment loss.

### Nonconstructed Roads and Routes

When site conditions are appropriate, the surface management agency may approve the creation or use of “primitive,” two-track roads or overland route corridors to meet the operator’s access needs. Primitive roads and route corridors may serve as appropriate access to exploration drilling locations where it is not certain if the well will be productive, or to producing wells where vehicle traffic is infrequent due to the use of off-site production facilities and automated well monitoring.

The appropriateness of primitive roads or routes is both site-specific and use-specific and is typically based on many factors, such as anticipated dry or frozen soil conditions, seasonal weather conditions, flat terrain, low anticipated traffic, or driller’s or operator’s access needs. Primitive roads or routes necessitate low vehicle speed and are typically limited to four-wheel drive or high clearance vehicles. They can consist of existing or new roads with minor or moderate grading; two-track roads created by the operator’s direct vehicle use with little or no grading; overland routes within a defined travel corridor leaving no defined roadway beyond crushed vegetation; or any combination along the route. Operators should not flat-blade roads. Drainage must be maintained, where appropriate, to avoid erosion or the creation of a muddy, braided road.

These roads and routes must be used and maintained in a safe and environmentally responsible manner and are not intended for use as all-weather access roads. Resource damage must be repaired as soon as possible and the operator must consult with the surface management agency to determine if all or a portion of the road needs to be upgraded to an all-weather access road. When used and maintained appropriately, nonconstructed roads and routes have the advantage of reducing construction, maintenance, and reclamation costs and reducing resource impacts. The use of nonconstructed roads must be approved by the surface management agency.

## Constructed Roads

The surface management agency determines the appropriate road type and associated road design standards based on the expected traffic volume and other factors, such as seasonal or year-round use, the design vehicle, soil types, rainfall, topography, construction costs, compatibility with other resource values, and safety. This information is documented during the transportation planning process and onsite meeting. Road types may vary along the same route depending on the operator’s or the surface management agency’s access or resource protection needs. In some cases, exploration drilling may warrant a lower design standard or primitive road, mentioned previously, which could be upgraded if the well becomes a producing well.

### ***BLM Resource or FS Local Roads***

BLM resource or FS local roads are low-volume, single-lane roads. They normally have a 12 to 14 foot travelway with “intervisible turnouts,” as appropriate, where approaching drivers have a clear view of the section of road between the two turnouts and can pull off to the side to let the approaching driver pass. They are usually used for dry weather, but may be surfaced, drained, and maintained for all-weather use. These roads connect terminal facilities, such as a well site, to

collector, local, arterial, or other higher-class roads. They serve low average daily traffic (ADT) and are located on the basis of the specific resource activity need rather than travel efficiency.

### ***BLM Local or FS Collector Roads***

BLM local or FS collector roads may be single-lane or double-lane with travelways 12 to 24 feet in width and intervisible turnouts. They are normally graded, drained, and surfaced and are capable of carrying highway loads. These roads provide access to large areas and for various uses. They collect traffic from resource or local roads or terminal facilities and are connected to arterial roads or public highways. The location and standards for these roads are based on both long-term resource needs and travel efficiency.

They may be operated for either constant or intermittent service, depending on land use and resource management objectives for the area being served.

### ***BLM Collector or FS Arterial Roads***

BLM collector or FS arterial roads are usually double-lane, graded, drained and surfaced, with a 20 to 24 foot travelway. They serve large land areas and are the major access route into development areas with high average daily traffic rates. The locations and standards are often determined by a demand for maximum mobility and travel efficiency rather than a specific resource management service. They usually connect with public highways or other arterials to form an integrated network of primary travel routes and are operated for long-term land and resource management purposes and constant service.

## **General Design Specifications for Different Types of Roads**

### **Definitions**

**Design Criteria** are requirements that govern the selection of elements and standards for a road, such as resource management objectives, road management objectives, safety requirements, and traffic characteristics.

**Design Elements** are the physical characteristics of a road, such as the ditches, culverts, travelway clearing limits, curve widening, slopes, and drainage characteristics that, when combined, comprise the planned facility.

**Design Standards** comprise the lengths, widths, and depths of design elements, such as a 14-foot-wide travelway, 2-foot shoulders, 2:1 cut slopes, 3-foot curve widening, and 6 inches of crushed aggregate. Design terms are illustrated in Figure 2.

**Design Vehicle** is the vehicle most frequently using the road that determines the minimum standard for a

particular design element. No single vehicle, however, controls the standards for all the design elements for a road.

## BLM Resource and FS Local Roads

### ***Basic Design Requirements***

The surface management agency will provide requirements specific to proposed oil and gas roads during project planning and/or at the onsite review with consideration of safety, impacts on land and resources, and cost of transportation. Requirements for specific proposals may vary somewhat from the generalized requirements that follow.

- Design speed specific to oil and gas roads is 10 to 30 miles per hour. For the FS, this should generally be less than 15 miles per hour.
- Preferred travelway width is 14 feet with turnouts. For the FS, this can vary from two parallel vehicle tracks, bladed 12-foot sections with turnouts, or a broader defined overland corridor approved by the surface management agency.
- Recommended minimum horizontal curve radii is determined by the design vehicle and design speed.  
Where terrain will not allow the proper curve radii, curve widening is necessary. Specifications are available from the surface management agency.
- Road gradient has a major effect on the environmental and visual impact of a road, particularly in terms of erosion. The gradient should fit as closely as possible to the natural terrain, considering vehicle operational limitations, soil types, environmental constraints, and traffic service levels. The gradient should not exceed 8 percent except for pitch grades (300 feet or less in length) in order to minimize environmental effects. In mountainous or dissected terrain, grades greater than 8 percent up to 16 percent may be permissible with prior approval of the surface management agency.
- The primary purpose of turnouts is for user convenience and safety and to maintain user speed. Turnouts are generally naturally occurring, such as additional widths on ridges or other available areas on flat terrain. On roads open to the public, turnouts must be located at 1,000-foot intervals or be intervisible, whichever is less.
- Drainage control must be ensured over the entire road through the use of drainage dips, insloping, natural rolling topography, ditch turnouts, ditches, or culverts. Ditches and culverts may be

required in some situations, depending on grades, soils, and local hydrology. If culverts or drainage crossings are needed, they should be designed for a 25-year or greater storm frequency, without development of a static head at the pipe inlet.

- Gravel or other surfacing is not always required, but may be necessary for “soft” road sections, steep grades, highly erosive soils, clay soils, or where all-weather access is needed.
- At times, a limited number of oil field vehicles (critical vehicles) larger than the design vehicle may make occasional use of the road. The operator should consider these needs in road design.

### ***Field Survey Requirements***

Field survey requirements vary with topography, geologic hazard, potential for public and recreational use, or other concerns. Each surface management agency has survey requirements based on design requirements and concerns specific to the area. The surface management agency should be contacted as

early as possible to determine the survey requirements.

The following general requirements are imposed to control work and produce the desired road.

- A flagline is established along the construction route. Flags should be placed approximately every 100 feet, or be intervisible, whichever is less.
- Construction control staking may be required depending on conditions of the site.
- Culvert installations are located and staked.

### ***Design Drawings and Templates***

- On side slopes of 0 to 20 percent, where horizontal and vertical alignment can be worked out on the ground, a plan and profile drawing may not be required. Standard templates, drainage dip spacing, culvert locations, and turnout spacing guides would be acceptable.
- A plan and profile view would be the minimum drawing required on steeper slopes and in areas of environmental concern. The drawing should identify grade, alignment, stationing, turnouts, and culvert locations.



- Standard templates of road cross-sections and drainage dips are required for all resource, local, and higher-class roads. Figures 2 and 3 illustrate these sections.
- Additional information may be required in areas of environmental or engineering concern.

## ***Construction***

The operator must take all necessary precautions for protection of the work and safety of the public during construction of the road. Warning signs must be posted during blasting operations.

### *Clearing and Grubbing*

Clearing and grubbing will normally be required on all sections of the road. Exceptions would be allowed in areas of sparse, non-woody vegetation.

All clearing and grubbing should be confined to a specified clearing width (Figure 2), which is usually somewhat wider than the limits of actual construction (roadway). Branches of all trees extending over the roadbed should be trimmed to provide a clear height of 14 feet above the roadbed surface. All vegetative debris must be disposed of as specified by the surface management agency.

### *Excavation*

All soil material and fragmented rock removed in excavation is to be used as directed in the approved plan. Excess cut material shall not be wasted unless specified in the approved plan.

### *Roadbed Construction*

Roadbed material should not be placed when the materials or the surface are frozen or too wet for satisfactory compaction. Equipment should be routed over the layers of roadbed material already in place to help avoid uneven compaction anywhere along the travel route. Borrow material shall not be used until material from roadway excavation has been placed in the embankments, unless otherwise permitted. Borrow areas used by the operator must be approved prior to the start of excavation.

Roadside ditches should conform to the slope, grade, and shape of the required cross-section with no projections of roots, stumps, rocks, or similar debris. Side ditches must be excavated to a depth of 1-foot minimum below the finished road surface. Drainage turnout spacing on these ditches should not exceed 500 feet; slopes greater than 5 percent may require closer spacing of

turnout furrows (wing ditches or relief ditches).

## BLM Local and FS Collector Roads

### ***Basic Design Requirements***

- Design speed is generally 15 to 50 miles per hour. For the FS, it is 15 to 25 miles per hour. The selected design speed establishes the minimum sight distance for stopping and passing, and road geometrics such as minimum radius of curvature, the gradient, and type of running surface.
- Travelway minimum is 14 feet (single lane) and 24 feet (double lane) with intervisible turnouts, as may be required.
- Recommended minimum horizontal curve radius is 220 feet. Where terrain will not allow 220-foot curve radii, curve widening is necessary. Super-elevation should be considered at speeds greater than 20 miles per hour. Specifications are available from surface management agency engineering offices.
- Vertical curves should be designed with an appropriate “k” value (rate of vertical curvature length per percent of “A”, the algebraic difference in grade) based on design speed (for example on FS, crest vertical curves, 30 mph k=9; 40 mph k=22; 50 mph k = 45).
- Maximum grades should not exceed 8 percent. Pitch grades for lengths not to exceed 300 feet may be allowed to exceed 8 percent in some cases.
- All culverts must be sized in accordance with accepted engineering practices and any special environmental concerns. The minimum size culvert in any installation is 18 inches. Drainage crossings and culverts should be designed for a 25-year or greater storm frequency and allow fish passage in perennial streams where fish are present.
- Turnouts are required on all single-lane roads. Turnouts must be located at 1000-foot intervals or be intervisible, whichever is less. The length should not be less than 100 feet, with additional 50-foot transitional tapers at each end.
- Surfacing may be required to provide all-weather access. If surfacing is needed, aggregate size, type, amount, and application method will be specified by the local office of the surface management agency. Subgrade analysis may be required to determine load-bearing capacities.

### ***Field Survey Requirements***

Generally, the survey requirements for these roads are similar to those for BLM resource and FS local roads. These roads, however, are designed for higher average daily traffic rates and greater speeds. Thus, in addition to flagline and culvert survey requirements, an instrument or topographic survey with preliminary centerline staking and slope staking is usually required on steep terrain and in areas requiring special engineering. Specific survey requirements are available at the local office of the surface management agency.

### ***Design Drawings and Templates***

- Generally, the required drawings for this road class would include a plan and profile (Figure 4). The drawing should identify grade, location, stationing, surfacing, turnouts, culvert locations, and drainage dip spacing.
- Standard templates of the proposed road cross-section(s) (Figures 2 and 3) and drainage dip design are required for this type of road.
- Additional information may be required in areas of environmental or engineering concern.

### ***Construction***

- Drainage dips, construction, and spacing are the same as for BLM resource and FS local roads.
- Culvert cross-drains should be used in lieu of drainage dips for road grades in excess of 10 percent. Culvert installation is discussed in the Drainage and Drainage Structure Section.
- Construction standards are the same as given in the BLM Resource and FS Local Roads Section.

## **BLM Collector and FS Arterial Roads**

### ***Basic Survey and Design Requirements***

- Vertical, horizontal, and topographic data, as well as significant features should be plotted on standard plan and profile sheets to a scale of 1 inch = 100 feet horizontal and 1 inch = 20 feet vertical, or as otherwise directed by the surface management agency. The design shall conform to

the most current edition of the AASHTO, *Guide-lines for Geometric Design of Very Low-Volume Local Roads*, for access roads with an anticipated average daily traffic of less than 400 vehicles.

- Plot “L” (layout) line along “P” (preliminary) line using the following design standards criteria:
  - Design speed is 30 miles per hour or greater unless otherwise directed.
  - Travel width-minimum is 20 feet, maximum is 24 feet.
  - Minimum horizontal curve radius is 460 feet unless shorter radii are approved. The curve radius must take into account super-elevation.
  - Design vertical curves with an appropriate “k” value based on design speed.
  - Maximum grade is 8 percent (except pitch grades not exceeding 300 feet in length and 10 percent in grade).
  - Mass diagrams and earthwork balancing may be required. Obvious areas of waste or borrow shall be noted on the plan and profile as well as proposed locations of borrow or waste disposal areas.
  - All culverts should be designed for a minimum 25-year storm frequency with an allowable head that does not overlap the roadway or cause damage. However, the minimum acceptable size culvert diameter is 18 inches. Show all culverts planned to accurate vertical scale on plan profile sheets.
  - Slope staking is required.

### ***Design Drawings and Templates***

- Complete plan and profile drawings are required for any BLM collector or FS arterial road (Figure 4). These drawings should identify grade, location, stationing, and all culvert sizes and locations (see Figure 7 for examples).

- Standard templates of road cross-sections, drainage design, and culvert location and installation are required (Examples in Figures 3 through 6).
- Mass diagrams and materials investigation and classification may be required.

### **Construction**

Except for the specific items that follow, construction standards are given in the BLM Resource/FS Roads or the BLM Local/FS Collector Roads Sections. Construction shall be performed under the direction of a licensed, professional engineer as required by the BLM, or a qualified engineer for roads on FS lands.

Excavation and fill construction will be performed to secure the greatest practicable degree of roadbed compaction and stability. Roadbed materials shall be placed parallel to the axis of the roadway in even, continuous, approximately horizontal layers not more than 8 inches in thickness. The full cross-section of the fill must be maintained as each successive layer is placed. Place successive layers of material on embankment areas to produce the best practical distribution of the material. The materials throughout the roadbed shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture, gradation, or compaction from the surrounding material. Ordinarily, stones coarser than a 3-inch-square mesh opening should be buried at least 4 inches below the finished surface of the roadway.

The operator should route construction equipment over the layers of roadbed material already in place and distribute the gravel evenly over the entire width of the embankment to obtain maximum compaction while placing the material and to avoid uneven compaction anywhere along the travel route.

Use excess excavation material, where practical, to improve the road grade line or to flatten fill slopes. Other waste areas must be approved prior to placement of waste material.

## **Road Maintenance**

When required, the operator shall submit a road maintenance plan for all roads that will be constructed or used in conjunction with the drilling program. The maintenance plan will contain provisions for maintaining the traveled way, protection of the roadway features, requirements for road management, and the method to be used in carrying out maintenance activities.

Maintenance activities normally required include monitoring, blading, surface replacement, dust abatement, spot repairs, slide removal, ditch cleaning, culvert cleaning, litter cleanup, noxious weed control, and snow removal. When applicable, specific areas shall be identified in the road maintenance plan for disposal of slide material, borrow or quarry sites, stockpiles, or other uses that



are needed for the project.

Key maintenance considerations include regular inspections; reduction of ruts and holes; maintenance of crowns and outslopes to keep water off the road; replacement of surfacing materials; clearing of sediment blocking ditches and culverts; maintenance of interim reclamation; and noxious weed control.

Conduct additional inspections following snowmelt or heavy or prolonged rainfall to look for drainage, erosion, or siltation problems. Blade only when necessary and avoid blading established grass and forb vegetation in ditches and adjacent to the road. Ensure that maintenance operators have proper training and understand the surface management agency's road maintenance objectives.

Authorized users may perform their share of road maintenance, enter into road maintenance agreements administered by the users, or may be required to deposit sufficient funds with the surface management agency to provide for their share of maintenance. If the road has only one permitted user, other than incidental use by others, that user may have total responsibility for maintenance.

## **Drainage and Drainage Structures**

The proper design and construction of structures for the drainage of water from or through the roadway often contributes the most to the long-term success of the road and structure and minimizes maintenance and adverse environmental effects, such as erosion and sediment production. It is vitally important to keep the water off the road.

### **Road Drainage Design**

The most economical control measure should be designed to meet resource and road management objectives and constraints. The economic considerations should include both construction and maintenance costs. The need for drainage structures can be minimized by proper road location. However, adequate drainage is essential for a stable road. A proper drainage system should include the best combination of various design elements, such as ditches, culverts, drainage dips, crown, in-slope or out-slope, low-water crossings, subsurface drains, and bridges.

### **Surface Drainage**

Surface drainage provides for the interception, collection, and removal of water from the surface of roads and slope areas. The design may need to allow for debris passage, mud flows, and water heavily laden with silt, sand, and gravel. Culverts should be designed in accordance with applicable

practices adopted by State and Federal water quality regulators under authority of the Federal Clean Water Act (CWA). Culverts should accommodate a 10-year flood without development of a static head and avoid serious velocity damage from a 25-year flood.

### ***Subsurface Road Drainage***

Subsurface drainage is provided to intercept, collect, and remove groundwater that may flow into the base course and subgrade; to lower high water tables; or to drain locally saturated deposits or soils.

### **Drainage Structures**

Proper location and design can provide economical and efficient drainage in many cases. However, structural measures are often required to ensure proper and adequate drainage. Some of the most common structures are drainage dips, ditches, road crowning, culverts, and bridges.

### ***Drainage Dips***

The primary purpose of a drainage dip is to intercept and remove surface water from the travelway and shoulders before the combination of water volume and velocity begins to erode the surface materials. Drainage dips should not be confused with water bars, which are normally used for drainage and erosion protection of closed or blocked roads. See Figure 5 for an illustration of a typical drainage dip and construction specifications. Spacing of drainage dips depends upon local conditions such as soil material, grade, and topography. The surface management agency should be consulted for spacing instructions.

### ***Ditches***

The geometric design of ditches must consider the resource objectives for soil, water, and visual quality; maintenance capabilities and associated costs; and construction costs. Ditch grades should be no less than 0.5 percent to provide positive drainage and to avoid siltation. The types of ditches normally used are drainage, trap, interception, and outlet.

### ***Road Crowning***

Roads that use crowning and ditching are common and can be used with all road classes, except non-constructed roads. This design provides good drainage of water from the surface of the road.

Drainage of the inside ditch and sidehill runoff is essential if the travelway is to be kept dry and

passable during wet weather.

### **Culverts**

Culverts are used in two applications: in streams and gullies to allow normal drainage to flow under the travelway and to drain inside road ditches. The latter may not be required if drainage dips are used. The location of culverts should be shown on the plan and profile or similar drawings or maps submitted with the APD.

All culverts should be laid on natural ground or at the original elevation of any drainage crossed, except as noted for ditch relief culverts. See Figures 6 and 7 for installation details.

Culverts should have a minimum diameter of 18 inches. The diameter should be determined by the anticipated amount of water that would flow through the culvert. Factors to be considered include the geographic area being drained, soils and slopes in the drainage area, annual precipitation, and likely storm events.

The outlet of all culverts should extend at least 1 foot beyond the toe of any slope. It may be necessary to install rip-rap or other energy dissipation devices at the outlet end of the culvert to prevent soil erosion or trap sediment (see example in the photograph).

All culverts used in the construction of access roads should be concrete, corrugated metal pipe made of steel, or properly bedded and backfilled corrugated plastic pipe. Only undamaged culverts are to be used, and any culvert should be inspected for damage prior to installation. All spots on the pipes where the zinc coating has been injured should be painted with two coats of zinc-rich paint or otherwise repaired as approved by the surface management agency.

Excavation, bedding, and backfilling of culverts should be conducted according to requirements of the surface management agency and good engineering practices. Compliance with applicable Clean Water Act Best Management Practices and requirements for passage of aquatic species is required.

### **Ditch Relief Culverts**

Ditch relief culverts are installed to periodically relieve the ditch line flow by piping water to the opposite side of the road where the flow can be dispersed away from the roadway. The spacing of ditch relief culverts (Figure 6) is dependent on the road gradient, soil types, and runoff characteristics.

A culvert with an 18-inch diameter is the minimum for ditch relief to prevent failure from debris blockage.

The depth of culvert burial must be sufficient to ensure protection of the culvert barrel for the design life of the culvert. This requires anticipating the amount of material that may be lost due to road use and erosion.

Ditch relief culverts can provide better flow when skewed with an entrance angle of 45 to 60 degrees with the side of the ditch. The culvert gradient should be greater than the approach ditch gradient. This improves the flow hydraulics and reduces siltation and debris plugging the culvert inlet. Culverts placed in natural drainages can also be used for ditch relief.

### ***Bridges and Major Culverts***

Federal Highway Administration (FHA) regulations and BLM and FS road manuals require that on roads open to public travel, all bridges and culverts that in combination span at least 20 feet horizontal distance, must comply with the National Bridge Inspection and Reporting Standards. Thus, BLM and FS manuals require that all such facilities have engineering approval from Regional or State offices. Operators are encouraged to prepare applications requiring major culverts or bridges to allow sufficient time for agency engineering evaluations. Construction of some stream crossings may require a Section 404 Corps of Engineers permit in addition to the approval of the surface management agency.

### ***Wetland Crossings***

Wetlands are especially sensitive areas and should be avoided, if possible. Generally, these areas require crossings that prevent unnatural fluctuations in water level. Marshy and swampy terrain may contain bodies of water with no discernible current. The design of culverts for roads crossing these locations requires unique considerations. Construction of some wetland crossings may require a Section 404 Corps of Engineers permit in addition to the approval of the surface management agency.

The culvert should be designed with a flat grade so water can flow either way and maintain its natural water level on both sides. The culvert may become partially blocked by aquatic growth and should be installed with the flowline below the standing water level at its lowest elevation. Special attention must be given to the selection of culvert materials that will resist corrosion.

### ***Low-Water Crossings***

Roads may cross small drainages and intermittent streams where culverts and bridges are unnecessary. The crossing can be effectively accomplished by dipping the road down to the bed of the drainage. Site-specific designs and the construction of gravel, rip-rap, or concrete bottoms may be required in some situations. In no case should the drainage be filled so that water will be impounded. Low-water crossings that are not surfaced should not be used in wet conditions. Low-water crossings, in combination with culverts, may be utilized if the crossing is designed such that the structure is stable and self cleaning.

### **Subdrainage**

If water is not removed from the subgrade or pavement structure, it may create instability, reduce load-bearing capacity, increase possible damage from frost action, and create a safety hazard by freezing on the road surface.

Perforated pipe drains and associated filter fabric or aggregate filters may be used when necessary to provide subdrainage. Other methods may be approved by the authorized officer.

Subdrainage systems may effectively reduce final road costs by decreasing the depth of base course needed, thereby reducing subgrade widths. This, in turn, results in less clearing and excavation. Maintenance savings may also be realized as the result of a more stable subgrade.

The solutions to subdrainage problems can be expensive. Road management techniques, such as reducing traffic loads or removing traffic until a subgrade dries out, may be considered as an alternative.

## **Pipelines and Flowlines**

### **Construction**

Steep hillsides and water courses should be avoided in the location of pipelines and flowlines. Flowline routes should take advantage of road corridors wherever possible to minimize surface disturbance and provide better leak detection and access for installation and repair operations. Consider maintenance needs and safety when burying power and pipelines in or immediately adjacent to the road.

When clearing is necessary, the width disturbed should be kept to a minimum. Topsoil material must be stockpiled to the side of the routes where cuts and fills or other surface disturbances occur during pipeline construction. Topsoil material must be segregated and not be mixed or covered with subsurface material. Bladed materials must be placed back into the cleared route upon completion of construction and returned back to the original contour before reapplying topsoil.

Pipelines and flowlines should be tested for leaks before backfilling trenches. Pipeline trenches should be compacted during backfilling. After construction, cut-and-fill slopes must be regraded to conform to the adjacent terrain and reclaimed. Pipeline rights-of-way must be maintained in order to correct backfill settling and prevent erosion.

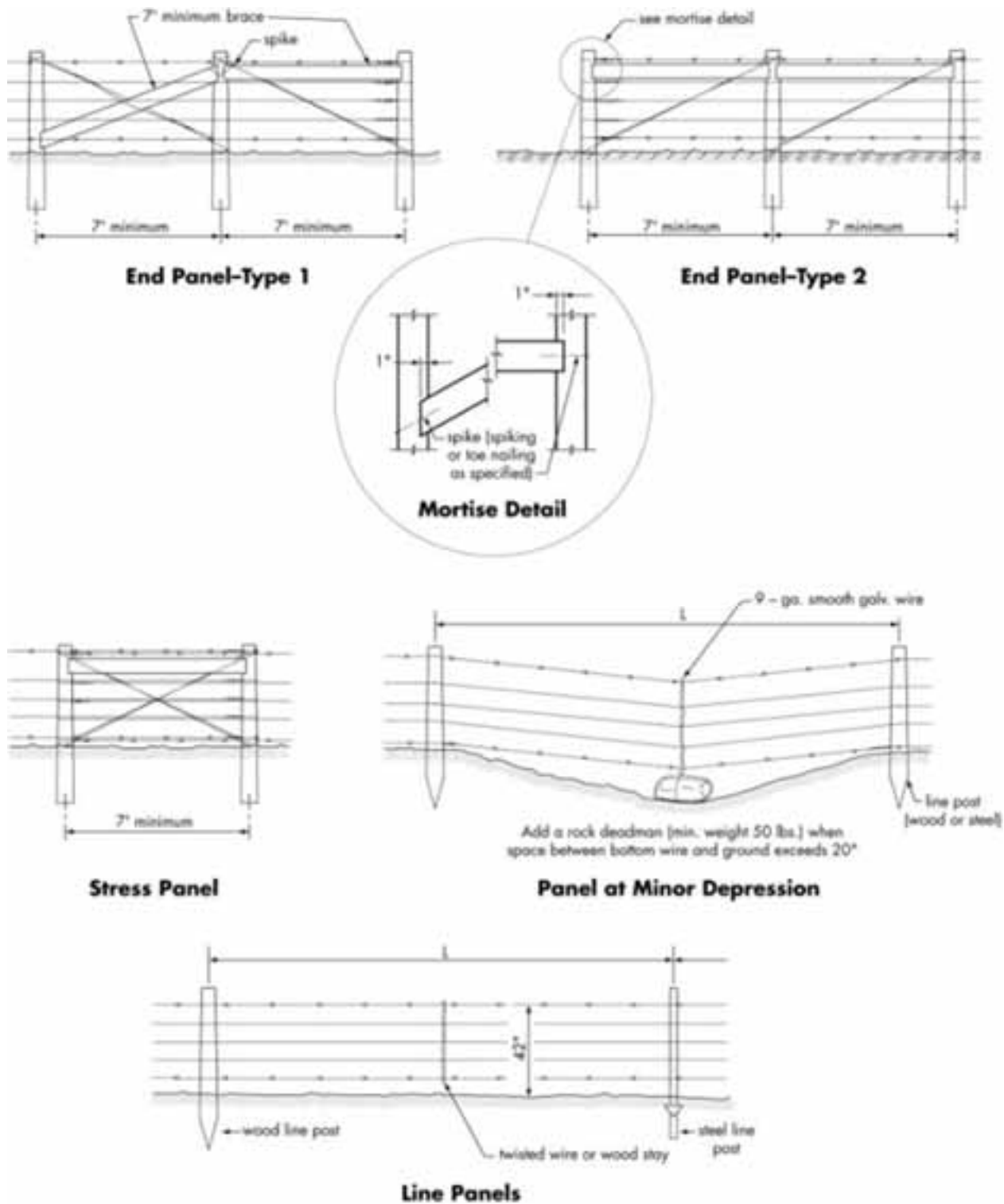
Pipeline construction should not block, dam, or change the natural course of any drainage. Suspended pipelines should provide adequate clearance for high-flow events, floating debris, wildlife, or livestock. Pipelines buried across stream crossings should be buried below the scouring depth.



# Appendix D

The Gold Book

## Figure 1: Exclosure Fence Construction Standards



# Appendix E

## Applications for Permits to Drill (APDs) for Pittsburgh Federal 2H and 3H

Form 3100-3  
(August 2007)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED  
(BBL No. 104-0037)  
Expires July 31, 2010

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NOM-95170
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6. If Indian, Allottee, or Tribal Name
2. Name of Operator: Newfield Production Company		7. If Unit or CA Agreement, Name and No.
3a. Address: 1001 17th Street, Suite 2000 Denver, CO 80202		8. Lease Name and Well No. Pittsburgh Federal 153-96-3-2H
3b. Phone No. (include area code) (303) 382-4470		9. API Well No.
4. Location of Well (Report location clearly and in accordance with any State requirements) At surface: NWNE Sec 3 175' F/W, 2000' F/E, 4800'36.20" N Lat 103000'32.28" W Long At proposed prod. zone: SESE Section 3, T153N, R96W 250' F/W, 650' F/E		10. Field and Pool, or Exploratory Sand Creek - Bakken
14. Distance in miles and direction from nearest town or post office 13 Miles Northwest of Kaena, ND		11. Sec., T. R. M. or BLM and Survey or Area Lot 2 Section 3, T153N, R96W 5th PM
13. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drg. and line, if any)	16. No. of acres in lease 520 Ac	12. County or Parish McKenzie County
18. Distance from proposed location* to nearest well, drilling, completed, applied for, or line lease, ft. 3100'	19. Proposed Depth 10,150' TVD 15,386' MD	13. State ND
21. Elevations (Show whether (DF, KDB, RT, CL, etc.) 2147' GL	22. Approximate date work will start* 06/01/2011	20. BLM/BIA Permit No. or file WYB000493
24. Attachments		23. Estimated duration 45 Days

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, must be attached to this form:

- Well plan certified by a registered surveyor.
- A Drilling Plan.
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPD must be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification.
- Such other site specific information and/or plans as may be required by the BLM.

25. Signature	Name (Printed Type) Eric Sundberg	Date 11/09/2010
Title Regulatory Lead		
Approved by (Signature)	Name (Printed Type)	Date
Title Officer		

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 18 U.S.C. Section 1012, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

\*(Instructions on page 2)

Form 1000-3  
(August 2007)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED  
O&G Op. 1004-0117  
Expires July 31, 2009

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NDM-95179
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator: Newfield Production Company		7. If Unit or CA Agreement, Name and No.
3a. Address: 1001 17th Street, Suite 2000 Denver, CO 80202		8. Lease Name and Well No. Pittsburgh Federal 153-06-3-3H
3b. Phone No. (include area code) (303) 382-4470		9. API Well No.
4. Location of Well (Report location clearly and in accordance with any lease requirements.) At surface: NW1/4 Sec 3-175' F&L, 2075' F&L 48008'28.26" N Lat 103000'33.40" W Long At proposed prod. zone: SWSE Section 3, T153N, R96W 250' F&L, 2640' F&L		10. Field and Pool, or Exploratory Sand Creek - Boskins
11. Sec., T, R, M, or BBL and Survey or Area Lot 2 Section 3, T153N, R96W 5th PM		12. County or Parish McKenzie County
13. State ND		14. Distance in miles and direction from nearest town or post office* 13 Miles Northwest of Keene, ND
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drg. unit line, if any)	16. No. of acres in lease 520 Ac	17. Spacing Unit dedicated to this well 640 acre spacing (NDAC 43-02-03-18)
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth 10,159' TVD 14,901' MD	20. BLM/BIA Bond No. on file WYB000493
21. Elevations (Show whether LH, KTB, RT, GL, etc.) 2147' GL	22. Approximate date work will start* 06/01/2011	23. Estimated duration 45 Days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, must be attached to this form:

- Well plat certified by a registered surveyor.
- A Drilling Plan.
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification.
- Such other site specific information and/or plans as may be required by the BLM.

25. Signature	Name (Printed Type) Eric Sundberg	Date 11/09/2010
Title Regulatory Lead		
Approved by (Signature)	Name (Printed Type)	Date
Title Officer		

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.  
Conditions of approval, if any, are attached.

Title III U.S.C. Section 1001 and Title 45 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

\*(Instructions on page 2)





## Surface Use Plan

Company Name: **Newfield Production Co.**  
Lease Number: **NDM-95176**  
Location: **SECTION 3: T153N-R96W (NWNE)**  
Well Number: **Pittsburgh Fed 153-96-3-2H, 3H**

### 1. General Access

Beginning at the town of Keene, ND, travel northerly on Highway 23 for approximately 12.3 miles to McKenzie County Road 2 (NFSR 869). From this point, turn left and travel westerly for 5.0 miles to XTO White Federal 34X-34 access road. Turn right and travel this gravel road northerly for 0.8 miles to the proposed location.

Existing roads and the general access are shown on **MAPS A & B**.

### 2. Access Roads to be constructed

A new access road will need to be constructed. The access road is 208 feet in length.

The new road will be completed as a single lane 16-foot sub-grade road with required turnout(s) as shown on **MAP B** and would require a 40 ft. construction width.

If conditions warrant, the travel way will be graveled with a minimum of 6 inches of 2-inch minus pit run gravel or crushed gravel prior to bringing production equipment onto the location. Design, construction, and maintenance of the road will be in compliance with the standards contained in BLM Manual, Section 9113 (Roads), and in the "Gold Book", Oil and Gas Surface Operating Standards for Oil and Gas Exploration and Development, Fourth Edition 2007 and the US Army Corps of Engineers COA.

If the access road is dry during construction, drilling, and completion activities, the access road will be watered to help road compaction activities and minimize soil loss due to blowing dust.

**Maintenance:**

Operator shall regularly maintain the road in a safe, stable condition. A regular maintenance program shall include, but not be limited to, blading, ditching, culvert installation, drainage installation, surfacing, and cattle guards, as needed. Design, construction, and maintenance of the road will be in compliance with the standards contained in the US Army Corps of Engineers Conditions of Approval (COA) and the Bureau of Land Management.

3. **Location of Existing Wells**

All wells within a 1-mile radius or in the area and field surrounding this well are shown on attachment **MAP C**.

4. **Location of Existing and/or Proposed Production Facilities**

Please see **Exhibit 8** for the proposed production facility layout. Should any additional facilities be necessary or the proposed layout changed, a sundry notice and revised layout will be submitted to the Bureau of Land Management. **No facilities will be set with out approved sundry notice.**

Please see **Map E** for utility corridor location and routing. This corridor could contain a gas pipeline, oil gathering line, water line and electrical.

5. **Location and Type of Water Supply**

Water will be transported by truck along existing approved road ROW's, or as per plan approved by an Authorized Officer of the Bureau of Land Management. The source of fresh water for drilling and completion activities is in Watford City, ND and/or New Town, ND.

In the event fresh water is required for dust abatement during dirt construction or reclamation operations, Newfield will request approval of water source from the surface management agency.

Please see **Map A** for access route.

6. **Construction Materials**

All construction materials (sand, gravel, stone, soils, or topsoils) will be derived from within the proposed location and access road boundaries as shown on **MAP B**. Surfacing material will come from the Signalness scoria pit which is location in the SE Section 33, T151N, R96W operated by Neu Construction of Fairview, MT. See **MAP A** for access route. No materials

will be removed from Federal lands without prior approval from the governing agency

**7. Methods of Handling Waste Disposal**

Drilling fluids and cuttings will be contained in a tank on location, then hauled offsite for disposal. Tanks will be used for storage of produced fluids while producing. Fracture stimulation fluids will be flowed back to the storage tanks.

No significant amounts of produced water are anticipated. If produced water becomes an issue a sundry notice will be filed setting forth the method of water disposal.

Portable, self-contained toilets will be provided for human waste disposal. Upon completion of operations, or as needed, the toilet holding tanks will be pumped and the contents thereof disposed of in an approved sewage disposal facility. All state and local laws and regulations pertaining to disposal of human and solid waste will be complied with.

All garbage and non-flammable waste materials will be contained in a portable dumpster or trash cage. Upon completion of operations, or as needed, the accumulated trash will be transported to a State approved waste disposal site.

**Methods of Handling Hazardous Materials**

"Hazardous materials" meaning: any substance, pollutant or contaminate that is listed as hazardous under the Comprehensive Environmental Response Liability Act of 1980, as amended, 42 U.S.C. 9601 et. Seq. And its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recover Act of 1976 (RCRA) amended 42 U.S.C. 6901 et. Seq., and its regulations. The term hazardous materials also include any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA Section 101 (14), 42 U.S.C. 9601 (14), nor does the term include natural gas.

- Hazardous material specifically listed as a hazardous material or demonstrate characteristics of a hazardous material may be used, produced, transported, or stored on or within the well site, access, right-of-way or right-of-way facilities, or used in the constructions, operations, maintenance or termination of the right-of-way and/or its' facilities.

- All hazardous material, as defined above will be handled, transported, and/or utilized in manner consistent with Local, State, and/or Federal regulations.

8. **Ancillary Facilities**

A gas pipeline, oil pipeline and electrical line may become necessary if the well should become productive. The proposed utility route parallels the access road and is 208 feet in length. The proposed utility corridor is shown on **Map E**. The proposed gas pipeline will tie into an existing Bear Paw Energy pipeline at the existing road intersection.

9. **Well Site Layout**

Well site layout is shown on **Exhibit 5** (Location diagram), **Exhibit 6** (location cross-sections diagram) and **Exhibit 7** (Rig Layout)

**All equipment and vehicles will be confined to the access road, pad and spoil and topsoil storage areas.** If the well pad is dry during construction, drilling, and completion activities it will be watered to minimize soil loss due to blowing dust.

The fill section of the pad that supports the drill rig and any other heavy equipment will be compacted to 95% maximum density as determined by AASHOT test T 99.

**Flagging and Staking**

Slope, grade, and other construction control stakes (e.g., exterior boundary centerline, etc.) shall be placed, as necessary, to ensure construction in accordance with the surface use plan. The cut and fill slopes and spoil storage areas shall be marked with a stake and/or lath at 200 foot intervals. The tops of the stakes or laths shall be painted or flagged in a distinctive color. All boundary stakes and/or laths shall be maintained in place until final construction cleanup is completed. If stakes are disturbed, they shall be replaced before proceeding with construction.

**Fences**

The location will be fenced after all drilling and completions activities are completed. A cattle guard will be installed where the fence crosses the well access road.

All fences will be constructed as per the specifications in the "Gold Book", Oil and Gas Surface Operating Standards for Oil and Gas Exploration and



Development, Fourth Edition 2007 and the US Army Corps of Engineers COA Section 9 "Fences, Gates, Cages and Cattleguards".

#### **Reserve Pits**

The proposed well will be drilled with a closed loop mud system. A reserve pit will not be necessary for the drilling of the proposed well.

#### **10. Plans for Reclamation of the Surface**

Rat and mouse holes shall be filled and compacted from bottom to top immediately upon release of the drilling rig from the location.

#### **-Producing Well**

##### **Access:**

Spread topsoil from the road running surface to the edge of cuts and fills. Do not block drainage ditches or culverts with topsoil and associated organic matter. Seed the top soiled areas, barrow ditches, and travel surface as stated below.

##### **Wellpad:**

Re-contour the unused area of the pad, spread topsoil six inches deep, and seed the reclaimed areas of the well pad per the US Army Corps of Engineers Conditions of Approval Section 23.

#### **-Abandoned Well**

Prior to abandonment reclamation work, the operator shall submit a sundry notice describing their proposed reclamation plans.

The operator shall re-contour all disturbed areas by removing embankments, backfilling excavations, and grading to re-establish the approximate original contours of the land in the road and location.

The reclaimed well pad will be fenced with a four-strand barbed wire fence until vegetation is re-established and approved by the authorized officer.

#### **-Seeding**

All disturbed areas will be seeded using a drill equipped with a depth regulator. All seed must be drilled on the contour. Plant the seed between one-quarter and one-half inches deep. Where drilling is not



possible (too steep or rocky) broadcast the seed and rake or chain the area to cover the seed. If the seed mixture is broadcast, double the rate listed below. The seeding shall be repeated until a satisfactory stand, as determined by the Authorized Officer, is obtained. The first evaluation of growth will be made following completion of the first growing season after seeding.

Certified or registered seed mixture and application rates, in accordance with US Army Corps of Engineers COA Section 27.

We recommend seeding after September 1 and prior to ground frost.

#### **-Water Bars**

The operator shall construct water bars on all disturbed areas to the spacing and design specified by the authorized officer. Water bars are to be constructed to: (1) simulate the imaginary contour lines of the slope (ideally with a grade of one or two percent); (2) drain away from the disturbed area; and (3) begin and end in vegetation or rock whenever possible.

Water bars will be constructed per the guidelines located in the US Army Corps of Engineers COA Section 23 Reclamation.

#### **11. Surface Ownership**

Well pad and access road:  
US Army Corps of Engineers  
Omaha District  
P.O. Box 527, 201 First Street  
Riverdale, ND 58565  
(701) 654-7414

#### **12. Other, if applicable (x)**

The operator shall be responsible for weed control on disturbed areas within the exterior limits of the permit. The operator is responsible for consultation with the authorized officer and/or local authorities for acceptable weed control methods.

A "Pesticide Use Proposal" and pesticide label must be submitted by the operator to the Surface Management Office for approval prior to any chemical treatments.

The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for

knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are uncovered during construction, the operator is to immediately stop work and contact the authorized officer (AO).

No construction, reclamation, and/or maintenance will occur with frozen material or during periods when the soil is saturated or when watershed damage is likely to occur.

The frac fluids will be flowed to an open top flat tank until burnable gas is encountered (approximately 300bbls). At this time, the gas will be diverted to the flare stack(s) until such time that it can be connected to a gas pipeline. All hydrocarbons recovered in the flat tank will be transferred to production facilities of same location and the water will be hauled offsite for disposal.

#### **OPERATOR CERTIFICATION**

##### **OPERATOR**

Newfield Production Co.  
1001 17<sup>th</sup> Street, Suite 2000  
Denver, CO 80202

##### **PERMIT REPRESENTATIVE**

Eric Sandberg  
Regulatory Lead  
(303) 382-4470

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with operations proposed herein will be performed by Newfield Production Company and its contractors and subcontractors in conformity with this APD package and terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

Executed this 11 day of August, 2011

Name: Eric Sandberg  
Position Title: Regulatory Lead  
Address: 1001 17<sup>th</sup> Street, Suite 2000 Denver, CO 80202  
Telephone: (303) 382-4470  
Field Representative: Jeff Odum  
Telephone: (303) 501-3551

Signature: 

# **Appendix F**

## **Newfield's Field-Wide Storm Water Management Plan**

# **STORM WATER POLLUTION PREVENTION PLAN (SWPPP)**

## **Newfield Production Company North Dakota Oil and Gas Operations**

*Prepared for:*

Newfield Production Company  
1001 17<sup>th</sup> Street, Suite 2000  
Denver, Colorado 80202

*Prepared by:*

SWCA Environmental Consultants  
1043 Coffeen Avenue, Suite D  
Sheridan, Wyoming 82801

**July 3, 2008**

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Newfield Production Company  
North Dakota Oil and Gas SWPPP

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## **Newfield Production Company**

### **North Dakota Oil and Gas Operations**

#### **Construction Storm Water Pollution Prevention Plan.**

Newfield Production Company (Newfield) has prepared this Stormwater Pollution Prevention Plan (SWPPP) for the construction and reclamation of all of their oil and gas (O&G) operations in the state of North Dakota (ND). This document outlines Best Management Practices (BMPs) that may be applied under varying circumstances, and supports Notices of Intent (NOI) forms that have been submitted to the North Dakota Department of Health (NDDOH) where appropriate and required.

When appropriate, a Site Specific Project Summary will be attached to the SWPPP that is intended to provide site specific information that is not in the general ND SWPPP.

The Site Specific Project Summary will specify the following:

- Specific description of the proposed project.
- Specific location of the individual project in question.
- Disturbance area estimates.
- SWPPP implementation team member names.
- Potentially impacted water bodies.
- Planned timeframes for work.
- Project maps.

This Site Specific Project Summary is meant to support Newfield's ND SWPPP, which provides information such as:

- Operator Information.
- A general description of Newfield's O&G projects.
- The activities that the SWPPP implementation team will perform.
- Potential Pollutants.
- BMPs to be applied, with directions for installation.
- An inspection and maintenance plan.

When a project meets NDDOH criteria that requires the submission of a NOI Form, it will be attached to this SWPPP in an Appendix. The NOI will provide more specific details such as:

- Specific location of the individual project in question.
- Specific description of the proposed project.
- Planned timeframes for work.
- Potentially impacted water bodies.
- Company Certification.

### **Project Description.**

As specified by NDDOH, small oil and gas operations (less than five contiguous acres of disturbance) do not require a NOI to be submitted to the NDDOH, but do require that a SWPPP be implemented. If the surface disturbance exceeds five acres, but is less than 50 acres, a NOI must be submitted to NDDOH. If the disturbance exceeds 50 acres, a NOI and SWPPP must be submitted to NDDOH.

As part of the development of a new oil and gas well in North Dakota, a level well pad will be constructed at the well site by moving soil from high spots of the development area to the low spots. Additional ancillary facilities may also need to be constructed that could include roads and pipelines. The disturbed areas will generally be less than five contiguous acres. Stormwater control BMP's will be installed prior to commencement of construction as described in the SWPPP to prevent pollutant discharge to surface waters. BMP's will be kept on place until the site is fully reclaimed. If disturbance exceeds five acres, Newfield will prepare and submit any additional required documentation to NDDOH, and comply with the criteria outlined in General Permit No. NDR32-0000, Authorization to Discharge Under the North Dakota Pollution Discharge Elimination System.

### **Operator Information.**

Newfield can be contacted at:

Newfield Production Company  
Eric Sandberg  
1001 17<sup>th</sup> Street, Suite 2000  
Denver, Colorado 80202  
Office Phone: (303) 382-4470

### **Project Location.**

This information will be found in the Site Specific Project Summary.

### **Disturbance Area Estimates.**

This information will be found in the Site Specific Project Summary.

### **SWPPP Implementation Team.**

The persons listed in the following table will be responsible to ensure that the SWPPP is effectively implemented. They will ensure that appropriate BMP's are installed correctly, and maintained until the site is adequately reclaimed and stabilized. These persons will be responsible for implementing the required maintenance program that is outlined in Newfield's SWPPP.

SWPPP Implementation Team	
Name	Telephone Number
Eric Sundberg	(303) 382-4470
Michael Pontiff	(303) 382-4470
SWCA Environmental Consultants Attn: Brent Sobotka	(307) 673-4303

The team's duties include:

- Supervise implementation of the SWPPP.
- Oversee maintenance of BMPs identified in the SWPPP.
- Conduct or provide for inspection and monitoring activities as required by the permit.
- Identify any deficiencies in the SWPPP and ensure they are addressed through changes or additions to site BMPs.
- Ensure that changes in construction plans or on the construction site are addressed in the SWPPP and that the SWPPP is up-to-date with current construction site conditions.
- Ensure that employees are trained and knowledgeable with the requirements of the construction general permit and this SWPPP.

### **Potentially Impacted Water Bodies.**

This information will be found in the Site Specific Project Summary.

### **Potential Pollutants.**

Potential pollutants on a typical well pad construction site include:

- Sediment as a result of erosion.

---

Newfield Production Company  
North Dakota Oil and Gas SWPPP

- Fuel for equipment.
- Drilling fluids.

### **Planned Timeframe for Work.**

This information will be found in the Site Specific Project Summary.

### **BMPs.**

The primary goal of this SWPPP is to reduce or eliminate the pollutants that reach a water of the state as a result of construction activities. The primary pollutant of concern associated with the well pad construction is sediment. Therefore, the main focus of the BMPs discussed here will be to prevent the mobilization of sediment through erosion, and the subsequent deposition of the sediment in waters of the state. However, modern construction activities often present opportunities for pollutants such as fuel for equipment, chemicals used in well drilling, and human waste to reach waters of the state. BMPs will be presented here that address those issues as well.

A variety of BMPs are presented here with a general description of the scenarios under which each will be applied. Additionally, Appendices 3 through 17 give detailed instructions of how each BMP will be built or applied. The BMPs presented here will either employ physical facilities that actively control hydrologic parameters that contribute to a possible pollutant reaching a water of the state, or passively reduce the possibility that a pollutant can be mobilized by surface runoff.

The primary areas where sediment movement as a result of erosion needs to be controlled are in ditches along roads, and on hill slopes below areas of surface disturbance.

### **Vegetation Preservation.**

The first and foremost method for controlling sediment movement is to hold the sediment in place. The best way of doing this is with the roots of vegetation and the canopy cover that they provide. Since the areas that are subjected to oil field development are usually vegetated with native range grasses and sagebrush, efforts will be made to minimize disturbance to vegetated areas. Where this is not possible, disturbed areas will be reseeded with grass species of the landowner's choice as soon as it is practical to do so.

**Vegetative buffer strips** are areas of gently sloping vegetative cover that runoff water flows through before entering a stream, storm sewer, or other conveyance. The buffer strip may be an undisturbed strip of natural vegetation or it can be a graded and planted area.

Vegetative buffer strips act as living sediment filters that intercept and detain stormwater runoff. They reduce the flow and velocity of surface runoff, promote infiltration, and reduce pollutant discharge by capturing and holding sediments and other pollutants carried in the runoff water. Vegetative buffer strips function much like vegetated or grassed swales. Buffer strips, however, are fairly level and treat sheet flow across them, whereas grassed swales are

indentations that treat concentrated flows running along them. Additional information regarding vegetative buffer strips can be found on Appendix 3.

#### **Ditch and Road Sediment Control.**

Ditches along roads are designed to collect storm water runoff from road surfaces and funnel it to a drain, detention structure, stream channel, or to a flat field. By the nature of their design, ditches concentrate runoff water, thereby increasing erosion potential and sediment entrainment. Erosion potential tends to increase proportionately with gradient. As gradient steepens, water velocity increases, thereby increasing erosion potential, and the waters capacity to entrain sediment. BMPs presented here attempt to either reduce erosion potential, which will limit the sediment that can be mobilized, or reduce the velocity of runoff water, which will reduce the waters capacity to entrain sediment, and causing suspended sediment to fall out.

The primary method of choice for controlling sediment in ditches will be to install ditch check dams (Appendices 4-6), diversion trenches (Appendix 7), ditch relief culverts (Appendix 9), drainage dips (Appendix 8), or low water channel crossings (Appendix 10).

**Ditch check dams** can be constructed in a variety of ways. For the purposes of this SWPPP they will be constructed using silt fence, straw rolls, or rock. Their purpose is to create small detention pools on the upstream side of the check dam to reduce the velocity of the runoff water, allowing suspended sediment to fall out or be filtered through the BMP. The type of ditch check dams, and their spacing, is determined by the gradient of the ditch and is described in the appendices for each specific type of ditch check dam.

##### **Silt fence ditch check dams**

Silt fence ditch check dams will be installed in ditches along roads. The silt fence dams act to slow the velocity of runoff water, which will allow suspended sediment to fall out. Silt fence ditch check dams will be used on slopes up to 6%. Design, placement, and installation instructions are included in Appendix 4.

##### **Rock ditch check dams**

Rock ditch check dams will be installed in ditches along roads. The rock dams act to slow the velocity of runoff water, which will allow suspended sediment to fall out. Rock ditch check dams will be used on slopes steeper than 6%. Design, placement, and installation instructions are included in Appendix 5.

##### **Straw roll check dams**

Straw roll ditch check dams can be installed in ditches along roads. The straw roll dams act to slow the velocity of runoff water, which will allow suspended sediment to fall out. Straw roll ditch check dams will be used on slopes up to 6%. Design, placement, and installation instructions are included in Appendix 6.



**Diversion trenches** will be cut along road ditches. The trenches will radiate out to the side of the road. A small berm will be built in the ditch on the downstream side of the trench. The berm will redirect the runoff water flow in the ditch to a nondisturbed, vegetated area to the side of the road. This diversion will reduce the concentration of water that the ditch is carrying, and place it in an area where flow will be obstructed by vegetation, slowing the water and causing suspended sediment to fall out. Design, placement, and installation instructions are included in Appendix 7.

**Road Drainage Dips** are installed to intercept and remove surface water from the travel-way and shoulders before the combination of water volume and velocity begins to erode the surface materials. Design, placement, and installation instructions are included in Appendix 8.

**Ditch relief culverts** are installed to periodically relieve the ditch line flow by piping water to the opposite side of the road where the flow can be dispersed away from the roadway. The spacing of ditch relief culverts is dependent on the road gradient, soil type, and runoff characteristics.

A culvert with a 12-inch diameter is the minimum for ditch relief to prevent failure from debris blockage.

The depth of culvert burial must be sufficient to ensure that the culvert is not crushed by heavy vehicle traffic and to protect the culvert barrel for its design life. This requires anticipating the amount of material that may be lost due to road use and erosion.

Ditch relief culverts can provide better flow when skewed with an entrance angle of 45 to 60 degrees with the side of the ditch. The culvert gradient should be greater than the approach ditch gradient. This improves the flow hydraulics and reduces silt deposition and debris plugging the culvert inlet. Culverts placed in natural drainages can also be used for ditch relief. Design, placement, and installation instructions are included in Appendix 9.

**Low Water Crossings** can be used where roads cross small drainages and intermittent streams where culverts and bridges are unnecessary. Properly constructed low water crossings will minimize sediment movement caused by vehicles driving across stream channels. The crossing can be effectively accomplished by dipping the road down to the bed of the drainage. Site-specific designs and the construction of gravel, rip-rap, or concrete bottoms may be required in some situations. In no case should the drainage be filled so that water will be impounded. Low water crossings that are not surfaced should not be used in wet conditions. Design, placement, and installation instructions are included in Appendix 10.

**Erosion Control Matting** can be used to help limit erosion and establish vegetation in ditches where conventional seeding and/or structural methods may be inadequate. By reducing the negative effects of rainfall impact and runoff, erosion-control matting provides ditches with a temporary, stable environment for seed to germinate. Erosion-control matting is constructed of a variety of materials, including straw, wood excelsior, coconut or some combination thereof. These materials usually are stitched or glued to some type of synthetic or natural fiber netting that is either biodegradable or photodegradable (broken down by

light). Erosion control matting placed in ditches where significant flows can occur needs to be installed with great care to ensure it is not undermined during such events. Design, placement, and installation instructions are included in Appendix 11.

**Seeding and Mulch** In order to armor ditches and ephemeral stream channels from erosion, it is important to establish a healthy vegetative cover as soon as possible. To promote such growth, seeding and mulching the disturbed areas is important.

The intent of seeding disturbed areas is to promote the establishment of permanent, perennial vegetative cover, usually grass. In most areas of rural North Dakota, seeding with native species seed is preferred, as it tends to provide better long-term survivability. In areas that are potentially subjected to high flows, it may be necessary to re-seed if such an event occurs before the vegetation has been established.

Mulching involves the application of straw or other organic materials to form a temporary, protective soil cover. Mulch protects the soil surface from the forces of raindrop impact and overland flow. Organic mulches foster the growth of vegetation, reduce evaporation, insulates the soil, and suppresses weed growth. In areas that are potentially subjected to high flows, it may be necessary to re-mulch if such an event occurs before the vegetation has been established. Alternatively, a carefully installed erosion control blanket could provide the same, or better, protection while being more resistant to damage from flows of runoff. Design, placement, and installation instructions are included in Appendix 12.

**Vegetated Channels** slow the velocity of stormwater runoff as it moves down-channel. Additionally, the roots of the vegetation hold the soil in place and reduce erosion. Because grassed channels are not usually designed to control peak runoff loads by themselves, they are often used with other BMPs.

Where moderately steep slopes require drainage, grassed channels can include excavated depressions or check dams to enhance runoff storage, decrease flow rates, and improve pollutant removal. Peak discharges can be reduced by temporarily holding them in the channel. Pollutants can be removed from stormwater by filtration through vegetation, by deposition, or in some cases by infiltration of soluble nutrients into the soil. The degree of pollutant removal in a channel depends on how long the water stays in the channel and the amount of contact with vegetation and the soil surface. Local conditions affect the removal efficiency. Design, placement, and installation instructions are included in Appendix 13.

#### **Hill Slope Sediment Control.**

Disturbed areas on hill slopes present a serious challenge in controlling surface runoff and erosion. Areas such as this are frequently encountered on sides of well pads where cut and fill activities are needed to build safe roads or level working areas. If the disturbed areas are not protected, surface impact from raindrops can cause soil particles to become mobilized on the surface and can be carried to surface waters. Additionally, excess water will begin to concentrate and runoff. Energy associated with this runoff will cause rilling to begin, which will escalate to a rut, which will continue to escalate, if not corrected.

In order to minimize these erosive hazards, Newfield will disturb as little of the ground surface as possible. Where disturbance is unavoidable, topsoil will be removed and stockpiled. Hill slope barriers will be installed at the downhill side of the disturbed area, or the disturbed area will be covered with mulch or erosion control mats in order to prevent sediment from leaving the site. Once earthmoving activities have been completed, the stockpiled topsoil will be respread over the disturbed area, which will then be seeded and mulched. Disturbed areas that have over a 4% grade will have waterbars constructed or straw roll barriers on contour to slow runoff velocities and trap mobilized sediment. Areas that are too steep to hold mulch, or will not hold mulch for other reasons, will have erosion matting installed per directions in Appendix 11.

#### **Silt fence slope barriers**

Silt fence slope barriers will be installed on hill slopes below surfaces that have been disturbed by construction activities. The barriers intercept and pond runoff water that may be carrying suspended sediment. Ponding the water reduces the velocity of the runoff, and allows much of the sediment to fall out of suspension. Design, placement, and installation instructions are included in Appendix 14.

#### **Water bar slope barriers**

Water bar slope barriers are permanent installed berms with channels constructed on the contour of a hill slope. Water bars serve to limit the velocity of accumulated runoff water flowing down a hill slope. The water bars intercept and pond runoff water that may be carrying suspended sediment. Ponding the water reduces the velocity of the runoff, and allows much of the sediment to fall out of suspension. Design, placement, and installation instructions are included in Appendix 15.

#### **Straw roll slope barriers**

Straw roll slope barriers function by intercepting and ponding sediment-laden runoff. Ponding the water dissipates the energy of the incoming flow and allows much of the suspended sediment to settle. Water exits the straw roll slope barrier by flowing through the straw rolls. Design, placement, and installation instructions are included in Appendix 16.

**Erosion control matting** Erosion-control blankets are used to help limit erosion and establish vegetation on slopes and in ditches where conventional seeding and/or structural methods would be inadequate. By reducing the negative effects of rainfall impact and runoff, erosion-control blankets provide slopes and ditches with a temporary, stable environment for seed to germinate. Erosion-control blankets are constructed of a variety of materials, including straw, wood excelsior, jute, coconut or some combination thereof. These materials usually are stitched or glued to some type of synthetic or natural fiber netting that is either biodegradable or photodegradable (broken down by light). Design, placement, and installation instructions are included in Appendix 11.

**Seeding and Mulch** To maintain sheet flow, promote infiltration, and reduce problems associated with runoff or dust from bare soil surfaces after construction, it is important to establish a healthy vegetative cover on hill slopes as soon as possible. To promote such growth, seeding and mulching the disturbed areas is important.

The intent of seeding disturbed areas is to promote the establishment of permanent, perennial vegetative cover, usually grass. In most areas of rural North Dakota, seeding with native species seed is preferred, as it tends to provide better long-term survivability.

Mulching involves the application of straw or other organic materials to form a temporary, protective soil cover. Mulch protects the soil surface from the forces of raindrop impact and overland flow. Organic mulches foster the growth of vegetation, reduce evaporation, insulates the soil, and suppresses weed growth. Design, placement, and installation instructions are included in Appendix 12.

**Surface Roughening** is a technique that creates horizontal depressions, furrows, or other roughened surfaces on bare ground using tracked or other equipment. Roughened slopes are preferred because they aid the establishment of vegetation, improve water infiltration, decrease runoff velocity, and provide for sediment trapping. Graded areas with smooth, hard surfaces may be initially attractive, but such surfaces increase the potential for erosion. A rough, loose soil surface is more favorable for rain infiltration and moisture retention than hard, smooth surfaces; this aids in seed germination. Design, placement, and installation instructions are included in Appendix 17.

#### **Trash Disposal & Fueling Operations.**

In order to prevent petroleum based pollutants from reaching waters of the state, all equipment subject to on-site fueling will be fueled from truck-mounted tanks away from any stream channel. All fuel trucks will carry spill kits and all drivers will be trained in their use. In the event of a spill, impacted soils and absorbent materials will be handled by specialty contractors hired by Newfield. Any equipment found to be leaking will be repaired and the spilled fluid will be immediately cleaned up.

All trash generated on the project area will be stored in covered containers which will be periodically emptied by Newfield's contractors.

#### **Sanitary Services.**

A portable toilet will be kept on the project site while construction activities are under way. Location of the facilities will be determined by current needs. Disposal of waste will be handled by the contractor who is supplying the toilet.

#### **Inspections.**

- A member of the SWPPP implementation team, or other employees who are familiar with this document, will visually inspect disturbed areas, control measures,



construction site access points, and the materials source each 14 days and after each 1/2" rain or snow melt event.

- The inspection shall determine whether or not the BMPs are adequate and effectively minimizing erosion, sedimentation, and offsite transport of other pollutants such as sediment, petroleum products, trash, and construction debris.
- The inspection shall also determine what maintenance is required for the existing BMPs and where additional or different BMPs are necessary to adequately minimize offsite transport of pollutants.
- The results of the inspection will be documented on a copy of the Inspection and Maintenance form included with the SWPPP.

The person inspecting the site will complete an inspection and maintenance form to document the site condition, maintenance requirements, and necessary changes to the SWPPP. All inspection and maintenance (I&M) forms must be signed by an authorized member of the SWPPP team. All I&M forms will be retained with the SWPPP for at least three years. An inspection form is located at the end of this document.

### **Maintenance.**

Maintenance practices will include the following:

- Sediment removal: Built up sediment behind check dams and slope barriers will be removed when it has reached  $\frac{1}{2}$  the height of the dam or fence.
- All sediment removed from BMPs will be placed on the construction site where it will not enter a surface water, storm drain, neighboring property or re-enter a sediment control BMP.
- All silt fence will be inspected for tears and proper installation. Damaged silt fence will be repaired within 48 hours.
- All check dams will be checked for proper function. Any dams that have been breached, or where additional down-slope stabilization is required, shall be repaired within 48 hours.
- All diversion trenches will be checked for proper function. Any trenches that have been damaged shall be repaired within 48 hours.
- All water bars will be checked for proper function. Any water bars that have been damaged shall be repaired within 48 hours.
- All erosion control matting will be checked for proper function. Any matting that has been damaged shall be repaired within 48 hours.

### **Maps.**

Site maps will be found in the Site Specific Project Summary.



**Certification.**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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Printed Name of Person Signing

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Title

---

Signature of Applicant

---

Date

---

Telephone

---

Newfield Production Company  
North Dakota Oil and Gas SWPPP

11

## **Appendix 1 – Submitted Notice of Intent (NOI)**



**APPLICATION (NOTICE OF INTENT) TO OBTAIN  
COVERAGE UNDER NDPDES GENERAL PERMIT  
FOR STORM WATER DISCHARGES ASSOCIATED  
WITH CONSTRUCTION ACTIVITY (NDR10-0000)**  
NORTH DAKOTA DEPARTMENT OF HEALTH  
DIVISION OF WATER QUALITY  
SFN 19145 (2005)

FOR DEPT. USE ONLY

Date Received

Application No.

**GENERAL INFORMATION**

Name of Owner of Construction Project		Contact Person Name	Contact Phone No.
Mailing Address		City	State Zip Code
Type of Owner or Operator	<input type="checkbox"/> Developer/Builder <input type="checkbox"/> State of ND	<input type="checkbox"/> General Contractor <input type="checkbox"/> Federal	<input type="checkbox"/> Municipality <input type="checkbox"/> Other (Specify)
This NOI is to obtain coverage under Small Construction Activity (see Part I.D of permit):		<input type="checkbox"/> YES <input type="checkbox"/> NO	Small Construction Activity requires the submittal of an Annual Location Record as per Part II.B of the permit
Name of Construction Project (Large Construction Activity Only)			
Brief Description of Construction Activity (Please fill out for both Large and Small Construction Activity)			

**LARGE CONSTRUCTION ACTIVITY INFORMATION (Skip for small construction activity)**

Name of Operator Working at Site (i.e. general contractor, if known)		Contact Person Name	Contact Phone No.
Mailing Address		City	State Zip Code
Project Start Date	Estimated Completion Date	Estimated Area of Total Disturbance in Acres	
Project Location	Street	City	
	OR	Section	Township Range County
Receiving Waters	<input type="checkbox"/> Natural Surface Drainage	Name or Description of Receiving Waters	
	OR <input type="checkbox"/> Municipal Storm Sewer	Name of City	

**Signature Information**

<b>RETURN COMPLETED APPLICATION TO:</b>  North Dakota Department of Health Division of Water Quality, 4 <sup>th</sup> Floor 918 East Divide Avenue Bismarck, ND 58501-1947  Telephone: (701) 328-5210 Fax: (701) 328-5200	I certify that I am familiar with NDR10-0000 and NDCC 61-29-08, and with the possibility of fines and imprisonment for submitting false information. To the best of my knowledge and belief, the information in this application is true, complete, and accurate.	
	Printed name of Owner(s)	Title
	Signature of Owner(s)	Date
	Printed name of Operator(s)	Title
	Signature of Operator(s)	Date

(Attach additional pages if needed)

## **Appendix 2 – North Dakota General Permit for Storm Water Discharges Associated with Construction Activity**

Permit No.: NDR32-0000

Effective Date: July 1, 2004

Expiration Date: June 30, 2009

AUTHORIZATION TO DISCHARGE UNDER THE  
NORTH DAKOTA POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with Chapter 33-16-01 of the North Dakota Department of Health rules as promulgated under Chapter 61-28 (North Dakota Water Pollution Control Act) of the North Dakota Century Code,

facilities both qualifying for and satisfying the requirements identified in Part I of this permit

are authorized to discharge storm water associated with mining, extraction or paving material preparation activities

to waters of the state

in accordance with effluent limitations, monitoring requirements, and other conditions set forth herein

This permit and the authorization to discharge shall expire at midnight,

June 30, 2009.

\_\_\_\_\_  
Dennis R. Fewless, Director  
Division of Water Quality

\_\_\_\_\_  
Date



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## **PART I - PERMIT COVERAGE**

### **A. Eligibility and Coverage**

1. This permit applies to all areas within the jurisdiction of the state of North Dakota.
2. This permit applies to discharges composed (either in whole or in part) of storm water associated with industrial activity as defined in 40 CFR 122.26(b)(14) from any of the following:
  - a. Operations involved in mining or extracting activities, including processes to prepare materials for use, SIC Codes between 12 and 14;
  - b. Facilities operated to obtain or prepare materials for highway construction activities including concrete or asphalt batch plants, SIC Codes 1611, 2951 and some 327;
  - c. Equipment storage and maintenance yards supporting the industrial categories identified above.
3. Certain non-storm water discharges from facilities covered by this permit and meeting the requirements specified in Part II.A.

### **B. Limitations on Coverage**

This permit does not cover the following activities:

1. Storm water discharges from facilities or activities subject to a nationally established effluent limitations guideline or other performance standard under 40 CFR subchapter N.
2. Discharges or releases that are not storm water except those non-storm water discharges authorized under Part II.A.
3. Discharges to waters for which there is a total maximum daily load (TMDL) allocation for sediment and/or parameters associated with sediment transport are not covered unless you develop a SWPP plan that is consistent with the assumptions and requirements in the approved TMDL. To be eligible for coverage under this general permit, you must incorporate into their SWPP plan any conditions applicable to their discharges necessary for consistency with the assumptions, allocations and requirements of the TMDL. If a specific numeric wasteload allocation has been established that would apply to the project's discharges, the permittee(s) must incorporate that allocation into its SWPP plan and implement necessary steps to meet that allocation.
4. The placement of fill into waters of the state requiring local, state, or federal authorizations (such as U.S. Army Corps of Engineers Section 404 permits).
5. This permit does not substitute for obligations under the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), or National Historic Preservation Act (NHPA). It is your responsibility to ensure the project and resulting discharges comply with the respective requirements.
6. Storm water discharges that the Department determines will cause, or have the reasonable potential to cause or contribute to, violations of water quality standards.

Permit No.: NDR32-0000

Effective Date: July 1, 2004

Expiration Date: June 30, 2009

AUTHORIZATION TO DISCHARGE UNDER THE  
NORTH DAKOTA POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with Chapter 33-16-01 of the North Dakota Department of Health rules as promulgated under Chapter 61-28 (North Dakota Water Pollution Control Act) of the North Dakota Century Code,

facilities both qualifying for and satisfying the requirements identified in Part I of this permit

are authorized to discharge storm water associated with mining, extraction or paving material preparation activities

to waters of the state

in accordance with effluent limitations, monitoring requirements, and other conditions set forth herein

This permit and the authorization to discharge shall expire at midnight,

June 30, 2009.

\_\_\_\_\_  
Dennis R. Fewless, Director  
Division of Water Quality

\_\_\_\_\_  
Date

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  - a. Operations involved in mining or extracting activities, including processes to prepare materials for use, SIC Codes between 12 and 14;
  - b. Facilities operated to obtain or prepare materials for highway construction activities including concrete or asphalt batch plants, SIC Codes 1611, 2951 and some 327;
  - c. Equipment storage and maintenance yards supporting the industrial categories identified above.
3. Certain non-storm water discharges from facilities covered by this permit and meeting the requirements specified in Part II.A.

### **B. Limitations on Coverage**

This permit does not cover the following activities:

1. Storm water discharges from facilities or activities subject to a nationally established effluent limitations guideline or other performance standard under 40 CFR subchapter N.
2. Discharges or releases that are not storm water except those non-storm water discharges authorized under Part II.A.
3. Discharges to waters for which there is a total maximum daily load (TMDL) allocation for sediment and/or parameters associated with sediment transport are not covered unless you develop a SWPP plan that is consistent with the assumptions and requirements in the approved TMDL. To be eligible for coverage under this general permit, you must incorporate into their SWPP plan any conditions applicable to their discharges necessary for consistency with the assumptions, allocations and requirements of the TMDL. If a specific numeric wasteload allocation has been established that would apply to the project's discharges, the permittee(s) must incorporate that allocation into its SWPP plan and implement necessary steps to meet that allocation.
4. The placement of fill into waters of the state requiring local, state, or federal authorizations (such as U.S. Army Corps of Engineers Section 404 permits).
5. This permit does not substitute for obligations under the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), or National Historic Preservation Act (NHPA). It is your responsibility to ensure the project and resulting discharges comply with the respective requirements.
6. Storm water discharges that the Department determines will cause, or have the reasonable potential to cause or contribute to, violations of water quality standards.



**C. Obtaining Coverage and Authorization Effective Date**

1. To obtain authorization under this general permit for storm water discharges you must submit a complete application and develop a Storm Water Pollution Prevention (SWPP) plan in accordance with Part II.C of this permit. A plan must be in place as a condition of this permit and a copy of the plan must be retained by the operator of the facility. A copy of the plan must be submitted with the application for certain facilities as described in Part I.D.3.
2. Permit coverage will become effective 7 days after you submit a complete application unless otherwise notified by the Department (based on the earlier of postmarked date or department date-stamp).
3. Upon the effective date of permit coverage you, as the permit applicant, are authorized to discharge storm water from eligible activities under the terms and conditions of this permit.

**D. Application Contents**

1. You may use a Notice of Intent (NOI) form (or photo copy thereof) to complete your application. The NOI form (SFN 18686) is available at <http://www.health.state.nd.us/eq/Storm>.
2. The application shall contain, at a minimum, the following information:
  - a. Name and mailing address of the owner or operator
  - b. Contact name and phone number
  - c. Name of facility or site
  - d. A brief description of the nature of business or activity
  - e. Standard Industrial Classification (SIC) Code
  - f. Location of the site(s), including the county, latitude and longitude or township, range, section, and 1/4 section
  - g. Name of receiving water(s) or the name of the receiving municipal storm sewer system and receiving water(s)
  - h. The signature of the applicant(s), signed in accordance with Signatory Requirements of this permit.
3. You must include a copy of the Storm Water Pollution Prevention (SWPP) plan if either of the following apply:
  - a. The facility will occupy 50 acres or more (area dedicated to industrial activities); or
  - b. The facility will have a discharge point located with 2000 ft of, and flow to, a water body listed as impaired under section 303(d) of the Federal CWA due to sediment or parameters associated with sediment transport (see 303(d) List on Department's web site).
4. An operator of multiple temporary or portable operations may submit a single application for such activities. The operator must provide a copy of the SWPP plan for any locations that meet the criteria listed in previous item (Part I.D.3) prior to beginning operations on the site.
5. Operators of oil or gas extraction facilities (SIC codes 13) that experience a storm water discharge resulting in or contacting a reportable quantity release of oil or hazardous substance (release for which notification is required pursuant to 40 CFR 110.6, 40 CFR 117.21, 40 CFR 302.6) shall submit a NOI within 15 days of becoming aware of the release. As provided in 40 CFR 122.26 (c)(1)(iii), oil and gas extraction facilities that have not discharged a reportable quantity (RQ) of oil

or hazardous substances are not required to apply for a storm water permit. Permit coverage for equipment storage and maintenance facilities of the field services sector (SIC 1381-1389) may be requested to manage potential impacts to surface waters.

6. Local agencies may operate a local storm water management program or other sediment and erosion control program. The local authority may require that a copy of the application be provided to them for review and approval.

#### **E. Termination of Coverage**

1. Permittees wishing to terminate coverage under this permit must submit a Notice of Termination (NOT) or other written request identifying the facility, reason why the permit is no longer needed and signed in accordance with Part IV-E of this permit. Compliance with the conditions of this permit is required until a NOT is submitted.
2. Permittees may only submit a NOT after one of the following conditions have been met:
  - a. All storm water discharges associated with industrial activity have been eliminated and final stabilization (see definitions) has been achieved on all portions of the site for which the permittee is responsible.
  - b. The discharges were from an inactive coal mining operation no longer meeting the definition of a reclamation area under 40 CFR 434.11(i) because the performance bond issued to the facility by the appropriate SMCRA authority has been released; or a non-coal mining operation which has been released from applicable State or Federal reclamation requirements after December 17, 1990.
  - c. The discharges were from an oil or gas extraction facility where the areas affected by a reportable quantity release that resulted in coverage under this permit have been reclaimed and the facility has operated satisfactorily under a storm water pollution prevention plan for a minimum of three years.
  - d. Another operator/permittee has assumed control over all areas of the site that has not been finally stabilized in accordance Transfer provisions (Part IV.M) of this permit.

#### **PART II - STORM WATER DISCHARGE REQUIREMENTS**

- A. **Prohibition on Non-Storm Water Discharges.** The discharge of wastewater from processing operations or sanitary facilities is not authorized by this permit. The following non-storm water discharges may be authorized if the non-storm water sources are identified in the SWPP plan with a description of the pollution prevention measures to be implemented: fire-fighting, fire hydrant flushing, potable water line flushing, infrequent building and equipment wash down without detergents, uncontaminated foundation drains, springs, lawn watering and air conditioning condensate.
- B. **Releases in Excess of Reportable Quantities.** This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117, and 40 CFR 302. Any release of a hazardous substance, including a release in a storm water discharge, must be reported to the agencies identified in Part IV F. The potential discharge of hazardous substances in storm water discharges shall be minimized by including measures in the SWPP plan to prevent and respond to releases of hazardous substances. Should a reportable quantity release occur, the SWPP plan shall be revised to prevent the recurrence of such a release.

- C. **Storm Water Pollution Prevention Plans.** All facilities covered by this permit shall prepare and implement Storm water Pollution Prevention (SWPP) plans. The SWPP plan and revisions are subject to review by the Department. The major objectives of the plan are to identify potential sources of storm water pollution associated with industrial activity and ensure that practices are implemented to minimize the contribution of pollutants. Storm water management measures developed under other regulatory programs can be included in the SWPP plan or incorporated by reference.

The Storm Water Pollution Prevention Plan shall include the following:

1. **Site Description.**

- a. Provide a description of the type of activity conducted at the facility.
- b. A site map indicating drainage patterns, the outline of the drainage area for each storm water outfall, areas used for storage or disposal of materials, and any existing or planned structures to reduce storm water contamination. Clearly identify property boundaries, natural drainage ways receiving discharges, section, township, and range or lines of latitude and longitude. The map or drawing must be of suitable scale and quality to show the required information.
- c. Identify the individual(s) responsible for implementing, maintaining and revising the SWPP plan.

2. **Description of Potential Pollutant Sources.**

- a. Identify materials that are processed, handled, stored, or disposed at your site that have the potential to be released with storm water.
- b. An assessment of various sources at the site that could contribute pollutants to storm runoff. Each of the following shall be evaluated for the reasonable potential to contribute pollutants: loading/unloading operations, outdoor storage, disposal and processing activities, significant dust generating activities and disturbed area vulnerable to erosion. Factors to consider in assessing potential sources are: the nature and quantity of material, degree of exposure to storm water, history of spills or leaks, and any measures in place to control storm water.
- c. Identify sources of non-storm water discharges that may be present and controls used to minimize the impact of the source. If the non-storm water discharge is not authorized include measures to remove the illicit discharge.

3. **Storm Water Controls.** The plan shall describe the existing or planned controls for each source or operation that may contribute pollutants in storm runoff. A combination of Best Management Practices (BMPs) and structural controls must be implemented as appropriate to reduce pollutant contributions in storm water. Such practices include:

- a. Good housekeeping practices to maintain a clean and orderly facility. Litter, debris, chemicals and parts must be handled properly to minimize the exposure to storm water. This includes measures to reduce and clean up vehicle tracking of sediment off-site and generation of dust.
- b. Preventive maintenance practices must be provided for the inspection and maintenance necessary to ensure the proper operation of storm water management devices (oil water separators, catch basins, and silt fences) as well as equipment used or stored at a site.

- c. Spill prevention and response procedures must be developed where potential spills can occur. Where appropriate, specific handling procedures, storage requirements, spill containment and cleanup procedures shall be identified.
  - d. Employee training informs personnel of their responsibility in implementing the practices and controls included in the plan such as spill response, good housekeeping, and sediment control practices.
  - e. Sediment and erosion controls must be implemented on areas of operations vulnerable to erosion. The plan shall describe the appropriate control measures and when they will be implemented during the process for each major phase of site activity (such as clearing, grading for new mine areas or building support features). The description and implementation of controls shall address the following minimum components:
    - (1) Sediment basins, or an appropriate combination of equivalent sediment controls such as smaller sediment basins, and/or sediment traps, silt fences, fiber logs, vegetative buffer strips, berms, etc., are required for all down slope boundaries of the disturbance area and for those side slope boundaries as may be appropriate for site conditions.
    - (2) Temporary erosion protection (such as cover crop planting or mulching) or permanent cover must be provided for the exposed soil areas where activities have been completed or temporarily ceased. These areas include graded slopes, pond embankments, ditches, berms and soil stockpiles.
    - (3) All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the permittee must replace or modify the control for site situations.
    - (4) If sediment escapes the site, off-site accumulations of sediment must be removed in a manner and at a frequency sufficient to minimize off-site impacts. The plan must be modified to prevent further sediment deposition off-site.
  - f. Storm Water Management. The plan shall include a description of practices that will be installed during the construction phase of a new site or expansion to control pollutants in storm water discharges occurring after construction operations have been completed or incorporated into the reclamation of a temporary site. Such practices may include: storm water ponds; flow reduction by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems which combine several practices. The plan shall include an explanation of the technical basis used to select the practices to control pollution where flows exceed pre-development levels.
4. **Maintenance.** All erosion and sediment control measures and other protective measures identified in the plan must be maintained in effective operating condition. The plan must indicate as appropriate the maintenance or clean out interval for sediment controls. If site inspections, required in this permit, identify BMPs that are not operating effectively, maintenance shall be arranged and accomplished as soon as practicable.



5. **Inspections.** The plan must provide for site inspections to monitor the condition of storm water discharge outlets and effectiveness of BMPs. The permittee shall ensure that personnel who are familiar with permit conditions and the proper installation and operation of control measures conduct an inspection of the site according to the following schedule:
- a. Active fixed location facilities, shall conduct inspections within 48 hours or as soon as conditions allow following storm events of one (1) inch or more in 24 hours, with at least one inspection during a 6 month period when no such events occur. The storm event inspections are not required for facilities conducting an approved storm water sampling program.
  - b. Operators of temporary or portable facilities (sand and gravel, batch plants) shall conduct inspections on a monthly basis while the operation is active and once every 6 months until final stabilization is achieved after ceasing operations.
  - c. Inactive operations shall be evaluated, at a minimum, once in three years by a qualified individual with experience in surface water pollution issues (i.e. environmental, erosion control, reclamation or engineering). The objectives of such evaluations are to: 1) assess the stability and performance of existing runoff controls, and 2) identify areas adversely impacted by runoff from the site.

The inspection shall include discharge outlets from: disturbed areas of the site that have not reached final stabilization, areas used for storage of materials, structural control measures, and vehicle maintenance areas. These areas shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. The erosion and sediment control measures identified in the plan shall be observed to ensure that they are operating correctly and in serviceable condition. A record of inspections shall summarize the scope of the inspection, major observations relating to the SWPP plan, the date and name of personnel making the inspection. If necessary, the SWPP plan shall be revised based on the observations and deficiencies noted during the inspection.

6. **Plan Review and Revisions.**

- a. The plan shall be signed in accordance with the signatory requirements, Part IV-E, and retained on-site for the duration of activity at the permitted location.
- b. The permittee shall make plans available upon request to the Department, EPA, or, in the case of discharges to a municipal separate storm sewer system, to the operator of the municipal system.
- c. The permittee shall amend the SWPP plan whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to the waters of the state. The plan shall also be amended if the plan is found to be ineffective in controlling pollutants present in storm water.
- d. Oil or gas extraction facilities which have a discharge of a reportable quantity of oil or hazardous substance after the effective date of this permit shall submit a SWPP plan and provide for compliance with the terms of the plan within 30 days of the operator becoming aware of the release.



**D. Additional Terms and Conditions**

1. Dewatering or basin draining (e.g., pumped discharges, trench/ditch cuts for drainage) related to the permitted activity must be managed with the appropriate BMPs, such that the discharge does not adversely affect the receiving water or downstream landowners. The Permittee(s) must operate the discharge to minimize the release of sediment and provide energy dissipation measures to adequately protect the outlet from erosion. The dewatering is limited to storm water and small amounts of ground water that may collect on a site. A separate permit must be obtained for the release of water from other sources such as sand and gravel wash plants.
2. Concrete wash water shall not be discharged to waters of the state, storm sewer systems or allowed to drain onto adjacent properties.
3. Bulk storage structures for petroleum products and other chemicals shall have adequate leak and spill protection to prevent any spilled materials from entering waters of the state.
4. Storm water discharges from construction related activity inherent to the normal operation and expansion of covered facilities are covered by this permit. Such activities shall be conducted in accordance with the practices identified in the SWPP plan. Any newly constructed storm water discharges associated with industrial activity shall be added to the SWPP plan or, if appropriate, covered by another applicable NDPDES permit.

**PART III - SELF-MONITORING AND REPORTING**

**A. Non-Sampling Reporting Requirements**

1. Annual Inspection Summary.

A summary of the inspections outlined in the SWPP plan requirements (Part II.C.5) shall be provided on an annual basis. The summary shall consist of a listing of all incidents of sediment or significant material residue accumulation, or erosion due to storm water discharges observed during the calendar year. The summary shall also include the inspection date, outfall identification or location of incident, description of incident, estimated quantity of material or size of area affected, brief explanation of potential cause and remedial actions taken.

2. Annual Location Record.

Operators of portable or temporary facilities (such as sand and gravel operations, concrete or asphalt batch plants) shall maintain a location record that shows the location where they operated facilities. The location record shall include following:

- a. Permit number
- b. Name and mailing address of the owner or operator
- c. The site or plant name or number
- d. Location of each site (street address, latitude and longitude, or legal land description of township, range, section, and 1/4 section)
- e. Start date of each site
- f. The estimated area of total disturbance in acres of each site
- g. Name of water bodies within 2000 feet that may receive drainage from the site
- h. Status of each site (active, reclaiming, inactive)
- i. Date of final stabilization or when contoured to contain all storm water discharges

**3. Annual Report Submittal.**

A copy of the Location Record and/or Inspection Summary shall be submitted to the Department by January 31 of each year, covering the activities occurring during the preceding calendar year (January 1 through December 31). The report shall be submitted to the Department at the following address:

North Dakota Department of Health  
Division of Water Quality  
PO Box 5520  
Bismarck, ND 58506-5520

**B. Sampling Self-Monitoring Requirements**

1. Facilities are not required to conduct sampling on storm water discharges except for the following circumstances:
  - a. The Department directs the permittee, by written notification, to conduct sampling at a facility covered by this permit. Instances where sampling could be required include, but are not limited to, any of the following: 1) analytical data is needed to estimate water quality impacts, 2) discharges are shown to be generally of poor quality, or 3) the SWPP plan is delinquent or determined to be insufficient.
  - b. A permittee can sample storm water discharges as an alternative to reduce inspection requirements described in this section. Any request to conduct sampling in lieu of inspections shall be made in writing and approved by the Department. Permittees granted approval during prior versions of this permit may continue their sampling program.
2. The storm water sampling, where required, must conform to the requirements, procedures and conditions contained in appendix 2.

- C. Reporting.** Monitoring results shall be summarized and reported on Discharge Monitoring Report forms. If no discharge occurs during a reporting period, "no discharge" shall be reported. Each report shall cover a the calendar year. Monitoring reports must be postmarked by the last day of the month following the end of each annual reporting period (January 31). Signed copies of these, and all other reports required herein, shall be submitted to the Department at the following address:

North Dakota Department of Health  
Division of Water Quality  
P.O. Box 5520  
Bismarck, ND 58502-5520

**PART IV - STANDARD CONDITIONS**

- A. Duty to Comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give the Department advance notice of any planned changes at the permitted facility or of an activity which may result in permit noncompliance.
- B. Operation and Maintenance.** The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the

permittee to achieve compliance with the terms and conditions of this permit and with the requirements of the storm water pollution prevention plans. If necessary to achieve compliance with the conditions of this permit, this shall include the operation and maintenance of backup or auxiliary systems.

- C. **Duty to Provide Information.** The permittee shall furnish to the Department, upon request, copies of records required to be kept by this permit. When a permittee becomes aware that they failed to submit any relevant facts or submitted incorrect information in a permit application or any report, they shall promptly submit such facts or information.
- D. **Records Retention.** All records and information (including calibration and maintenance) required by this permit shall be kept for at least three years or longer if requested by the Department or EPA.
- E. **Signatory Requirements.** All applications, reports or information submitted to the Department shall be signed and certified.
1. All permit applications shall be signed by a responsible corporate officer, a general partner, or a principal executive officer or ranking elected official.
  2. All reports required by the permit and other information requested by the Department shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
    - (a) The authorization is made in writing by a person described above and submitted to the Department; and
    - (b) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

If an authorization under item 2 above is no longer accurate for any reason, a new authorization satisfying the above requirements must be submitted to the Department prior to or together with any reports, information, or applications to be signed by an authorized representative.

Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment."

- F. **Immediate Notification.** The permittee shall report any noncompliance or discharge which may seriously endanger health or the environment as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of the circumstances. The report shall be made to the EPA, Region VIII, Emergency Response Branch at (303) 293-1788 and the State of North Dakota, Division of Emergency Management at (701) 328-2121. In addition, a written submission to both the Department and EPA shall be provided within five days of the time that the permittee became aware of the circumstances. The submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the estimated time noncompliance is expected to continue if it has not been corrected; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

- G. **Bypassing.** Any bypass is prohibited except where unavoidable to prevent loss of life, personal injury, or severe property damage and there were no feasible alternatives to the bypass. The permittee shall provide notification of unanticipated bypasses as may be required by Part IV.F, Immediate Notification. If, for other reasons, a bypass is considered necessary, a request to bypass shall be submitted, at least 15 days in advance if possible, to the Department. No bypass of this type shall occur until permission has been obtained from the Department.

- H. **Upset Conditions.** An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of the following paragraph are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and the permittee can identify its cause(s);
2. The permitted facility was at the time being properly operated;
3. The permittee submitted notice of the upset as may be required under Part IV.F, Immediate Notification; and
4. The permittee complied with any remedial measures required under Part IV.I, Duty to Mitigate.

In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

- I. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. The permittee, at the Department's request, shall provide accelerated or additional monitoring as necessary to determine the nature and impact of any discharge.
- J. **Removed Materials.** Collected screenings, grit, solids, sludges, or other pollutants removed in the course of treatment shall be buried or disposed of in such a manner to prevent any pollutant from entering any waters of the state or creating a health hazard.
- K. **Right of Entry.** The permittee shall allow Department and EPA representatives, at reasonable times and upon the presentation of credentials if requested, to inspect the wastewater treatment facilities and monitoring equipment, to sample any discharges, and to have access to and copy any records required to be kept by this permit. For facilities which discharge to a municipal or other separate storm sewer, this shall also pertain to authorized representatives of the municipal operator or the separate storm sewer receiving the discharge.
- L. **Availability of Reports.** Except for data determined to be confidential under 40 CFR Part 2, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department and EPA. As required by the Act, permit applications, permits, and effluent data shall not be considered confidential.
- M. **Transfers.** This permit is not transferable except upon the filing of a Statement of Acceptance by the new party and subsequent Department approval. The Department may require the new operator to file a NOI or apply for and obtain an individual NPDDES permit as stated in Part I.D. The current permit holder should inform the new controller, operator, or owner of the existence of this permit and also notify the Department of the possible change.



- N. **New Limitations or Prohibitions.** The permittee shall comply with any effluent standards or prohibitions established under Section 306(a), Section 307(a), or Section 405 of the Act for any pollutant (toxic or conventional) present in the discharge or removed substances within the time identified in the regulations even if the permit has not yet been modified to incorporate the requirements.
- O. **Permit Actions.** This permit may be modified, revoked and reissued, or terminated for cause. Also, if there is evidence indicating potential or realized impacts on water quality due to any storm water discharge associated with industrial activity covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit or coverage under an alternative general permit in accordance with this Part. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition. The following pertains to individual or alternative general permits:
1. The Department may, at any time and by written notification only, require any person authorized by this permit to apply for and obtain either an individual NDPDES permit or to seek coverage under an alternative NDPDES general permit. Any person covered by this general permit may request to be excluded from such coverage by either applying for an individual NDPDES permit, or filing a Notice of Intent to be covered under an alternative NDPDES general permit.
  2. When an individual NDPDES permit is issued to a person otherwise subject to this permit or the person is approved for coverage under an alternative NDPDES general permit, the applicability of this permit to the individual permittee is automatically terminated upon the effective date of the individual permit or the date of approval for coverage under the alternative general permit. When an individual NDPDES permit is denied to a person otherwise subject to this permit, or the person is denied for coverage under an alternative NDPDES general permit, the applicability of this permit remains in effect, unless otherwise specified by the Department.
- P. **Need to Halt or Reduce.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- Q. **State Laws.** Nothing in this permit shall be construed to preclude the institution of legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation preserved under Section 510 of the Act.
- R. **Oil and Hazardous Substance Liability.** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.
- S. **Property Rights.** The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.
- T. **Severability.** The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.
- U. **Renotification.** Any request to retain coverage under a renewal of this permit shall be made in writing to the Department at least 15 days prior to the expiration date of this permit. Upon request by the Department, a new Notice of Intent shall be submitted.



## **PART V - DEFINITIONS**

"303d List" or "Section 303d List" means a list of North Dakota's water quality-limited waters needing total maximum daily loads or TMDLs developed to comply with section 303d of the Clean Water Act. A copy of the list is available on the state's web site at:

[http://www.health.state.nd.us/wq/sw/27\\_Publications/A\\_Publications.htm](http://www.health.state.nd.us/wq/sw/27_Publications/A_Publications.htm)

"BMP" or "Best Management Practices" means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the state. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

"Department" means the North Dakota Department of Health, Division of Water Quality.

"Energy Dissipation" means methods employed at pipe outlets to prevent erosion. Examples include, but are not limited to: concrete aprons, riprap, splash pads, and gabions that are designed to prevent erosion.

"Final Stabilization" means that:

1. All soil disturbing activities at the site have been completed and a uniform perennial vegetative cover with a density of 70 percent of the native cover for unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.
2. For areas with an average annual rainfall of less than 20 inches only, all soil disturbing activities at the site have been completed and temporary erosion control measures (e.g., degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years and achieve 70 percent vegetative coverage within three years without active maintenance.
3. For soil disturbing activities on land used for agricultural purposes, final stabilization may be accomplished by returning the disturbed land to its pre-disturbance agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to "waters of the state," and areas which are not being returned to their pre-disturbance agricultural use must meet the final stabilization criteria in (1) or (2) above.

"Grab" sample, for monitoring requirements, means a single "dip and take" sample collected at a representative point in the discharge stream.

"Inactive mining" or "inactive oil and gas operations" means areas, on or beneath lands, which were previously disturbed in activity related to the extraction, removal or recovery of coal, minerals, ores, or oil and gas from their natural deposits and were not otherwise subject to runoff controls or reclamation requirements. The term does not include areas of coal mining activity defined as "active mining area" or reclamation area" in 40 CFR 434.11 or areas which have been reclaimed, cleaned up or sealed under applicable SMCRA or equivalent requirements.

"Normal Wetted Perimeter" means the area of a conveyance, such as a ditch, channel, or pipe that is in contact with water during flow events that are expected to occur once every year.

"Non-storm water discharges" means discharges other than storm water. The term includes both process and non-process sources. Process wastewater sources that require a separate NPDDES permit include,

but are not limited to industrial processes, domestic facilities and cooling water. Non-storm water sources that may be addressed in this permit include, but are not limited to: fire-fighting, fire hydrant flushing, potable water line flushing, infrequent building and equipment wash down without detergents, uncontaminated foundation drains, springs, lawn watering and air conditioning condensate.

"Operator" means the owner, party, person, general contractor, corporation, or other entity that has operational control over a facility. The operator is responsible for ensuring compliance with all conditions of the permit and with development and implementation of the "storm water pollution prevention plan".

"Severe property damage" means substantial physical damage to property, damage to treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

"Significant materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

"Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (see 40 CFR 110.10 and CFR 117.21) or Section 102 of CERCLA (see 40 CFR 302.4).

"Stabilized" means the exposed ground surface has been covered by appropriate materials such as mulch, staked sod, riprap, wood fiber blanket, or other material that prevents erosion from occurring. Grass seeding alone is not stabilization.

"Storm water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

"Storm Water Associated with Industrial Activity" means storm water runoff, snow melt runoff, or surface runoff and drainage from industrial activities as defined in 40 CFR § 122.26(b)(14).

"Temporary Erosion Protection" means methods employed to prevent erosion. Examples of temporary cover include: straw, wood fiber blanket, wood chips, and erosion netting.

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

**Appendix 1 - Guidelines for designing, implementing and maintaining effective erosion and sediment controls**

The following practices need to be considered for effective erosion and sediment control:

- 1) Temporary (or permanent) sediment basins, or equivalent control must be provided where ten (10) or more acres of disturbed area drain to a common location prior to the runoff leaving the site or entering surface waters. The Permittee is encouraged, but not required, to install temporary sediment basins where appropriate in areas with steep slopes or highly erodible soils even if less than ten (10) acres drains to one area. The basins must be provide at least the following:

The basins shall be sized to provide 3,600 cubic feet of storage below the outlet pipe per acre drained to the basin. Alternative designs may be used which provide storage below the outlet for a calculated volume of runoff from a 2 year, 24 hour storm and provides not less than 1800 cubic feet of storage below the outlet pipe from each acre drained to the basin.

Basin outlets must be designed to avoid short-circuiting. The basin must be designed with the ability to allow complete basin drawdown (e.g., perforated riser pipe wrapped with filter fabric and covered with crushed gravel, pumps or other means) for maintenance activities, and provide a stabilized emergency overflow to prevent failure of pond integrity. Energy dissipation must be provided for the basin outlet.

- 2) Where the temporary sediment basin is not practical due to site limitations or nature of disturbance (such a developing a road way or initial stripping to build sediment pond or diversion) a combination of measures must be used within the disturbance area and down slope boundaries. In determining whether installing a sediment basin is attainable, the Permittee must consider public safety and may consider factors such as site soils, slope, and available area on site.
- 3) Provide temporary erosion protection or permanent cover for the exposed soil areas where activities have been completed or temporarily ceased. For those areas with a continuous positive slope within 200 lineal feet of a surface water, temporary erosion protection or permanent cover must be applied with 21 days of completing or ceasing earth moving activities. These areas include pond embankments, ditches, berms and soil stockpiles. Temporary stockpiles without significant silt, clay or organic components (e.g., clean aggregate stockpiles, demolition concrete stockpiles, sand stockpiles) are exempt from this requirement.
- 4) Temporary soil stockpiles must have effective sediment controls, and cannot be placed in surface waters, including storm water conveyances such as curb and gutter systems, or conduits and ditches.
- 5) The normal wetted perimeter of any temporary or permanent drainage ditch that drains water from a construction site, or diverts water around a site, must be stabilized within 200 lineal feet from the property edge, or from the point of discharge to any surface water. Stabilization should be completed within 24 hours of connecting to a surface water.
- 6) Pipe outlets must be provided with temporary or permanent energy dissipation within 24 hours of connection to a surface water.

- 7) In order to maintain sheet flow and minimize rills and/or gullies, there should be no unbroken slope length of greater than 75 feet for slopes with a grade of 3:1 or steeper.
- 8) Temporary or permanent drainage ditches and sediment basins that are designed as part of a treatment system (e.g., ditches with rock check dams) require sediment control practices only as appropriate for site conditions.

The following are maintenance and operation considerations for effective sediment and erosion control:

- 1) All erosion prevention and sediment control BMPs must be inspected to ensure integrity and effectiveness. All nonfunctional BMPs must be repaired, replaced, or supplemented with functional BMPs. The Permittee(s) must investigate and comply with the following inspection and maintenance requirements:
  - 1) All silt fences must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches 1/3 of the height of the fence. These repairs must be made within 24 hours of discovery, or as soon as field conditions allow access.
  - 2) Temporary and permanent sedimentation basins must be drained and the sediment removed when the depth of sediment collected in the basin reaches 1/2 the storage volume. Drainage and removal must be completed within 72 hours of discovery, or as soon as field conditions allow access.
- 2) Surface waters, including drainage ditches and conveyance systems, must be inspected for evidence of sediment being deposited by erosion. The Permittee(s) must remove all deffas and sediment deposited in surface waters, including drainage ways, catch basins, and other drainage systems, and restabilize the areas where sediment removal results in exposed soil. The removal and stabilization should take place within seven (7) days of discovery unless precluded by legal, regulatory, or physical access constraints. The Permittee shall use all reasonable efforts to obtain access. If precluded, removal and stabilization should take place within seven (7) calendar days of obtaining access. The Permittee is responsible for contacting all local, regional, state and federal authorities and receiving any applicable permits, prior to conducting any work.
- 3) Construction site vehicle exit locations must be inspected for evidence of off-site sediment tracking onto paved surfaces. Accumulations of tracked sediment must be removed from all off-site paved surfaces, as soon as practicable, or if applicable, within a shorter time specified by local authorities.



**Appendix 2 - Storm Water Sampling Requirements, Procedures and Conditions**  
Applicable to facilities conducting a sampling based monitoring program.

1. **Sample frequency and test parameters.** If a permittee is notified that sampling is required or obtains approval to conduct sampling in lieu of inspections, the sampling shall, at a minimum, consist of semiannual grab samples for the following parameters:
  - a. Oil and Grease (visual), if a sheen be observed, then a grab sample from the surface shall be collected and analyzed
  - b. pH (S.U.)
  - c. Total Suspended Solids (mg/l)
  - d. Total Phosphorus (mg/l)
  - e. Total Kjeldahl Nitrogen (mg/l)
  - f. Total Nitrates (mg/l)
  - g. Any pollutant that is limited in an effluent guideline applicable to the facility.
2. **Sample procedures.**
  - a. All samples and measurements taken shall be representative of the discharge. Samples shall be collected from discharges resulting from a storm event that is greater than 0.1 inches in magnitude and that has occurred at least 72 hours from the last 0.1-inch or greater storm event which generated runoff. Snowmelt which generates runoff considered to be equivalent to or greater than a 0.1-inch precipitation event qualifies for sampling purposes. However, no more than one sample per year for each sampling site can be from a snowmelt event.
  - b. For discharges from holding ponds or other impoundments with a 24-hour or greater retention capability, grab samples of the discharge may be obtained at any time. For all other discharges, grab samples shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample may be taken during the first hour of the discharge, provided the permittee submits a description of why the grab sample could not be obtained during the first 30 minutes with the DMR.
  - c. For storm events sampled, the permittee shall record the date and duration (in hours) of the event, rainfall amount or estimates (in inches) of the event, the approximate duration since the end of the last 0.1-inch or greater storm event which generated runoff, and an estimate of the size of the drainage area. The information shall also be included on DMRs. The permittee shall have the option of maintaining a rain gauge at his site or utilizing the nearest National Weather Service rain gauge station. Any gauge station used shall be located within 10 miles of the storm water discharge.
3. **Impractical or adverse conditions.** When a permittee is unable to collect samples due to impractical or adverse climatic conditions, the discharger must submit in lieu of sampling data a description of why samples could not be collected, including available documentation of the event. Impractical or adverse climatic conditions which may prohibit the collection of samples include: normal non-working hours, nightfall, or weather conditions that create dangerous conditions for personnel (local flooding, high winds, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impractical (drought, extended frozen periods, etc.).



4. **Representative sampling.** When a facility has two or more outfalls which the permittee believes would discharge substantially identical effluents, based on the features and activities within the areas drained by the outfalls, the permittee may submit a representative sampling plan in which at least 20 percent of all outfalls would be monitored. Permittees wishing to utilize this option shall submit documentation as to why they believe discharges from the sites will be substantially similar and also identify their proposed sampling sites. Upon approval by the Department, the representative sampling plan can be implemented.
5. **Equivalent monitoring plans.** Where appropriate, results for monitoring plans developed for other regulatory agencies or other purposes can be used for the requirements of this permit. The alternative monitoring plans can only be implemented upon written request by the permittee and subsequent written approval by the Department. When it is not feasible to develop a monitoring plan based on the percentage of outfalls, an alternative monitoring plan representative of the features and activities impacting storm water outfalls may be developed. The alternative plan must contain an explanation of why a percentage based plan is impracticable and how the plan is representative of the storm water discharges at the facility.
6. **Test Procedures.** The collection and transportation of all samples shall conform with EPA preservation techniques and holding times. All laboratory tests shall be performed by a certified laboratory in conformance with test procedures pursuant to 40 CFR 136. The method of determining the total amount of water discharged shall provide results within reasonable accuracy.
7. **Recording of Results.** For each sample taken, the name of the sampler, the exact place, and the date and time of the sampling shall be recorded. For each sample analyzed, the name of the laboratory, the name of the analyzer, the analytical techniques used, the test results, and the date and time of the analysis shall be recorded.
8. **Additional Monitoring.** If the discharge is monitored more frequently than this permit requires, all additional results, if in compliance with item 6, Test Procedures, shall be included in the summary on the Discharge Monitoring Report.

## **Appendix 3 – Vegetative Buffer Strips**

### ***Purpose and Operation***

Vegetative buffer strips are areas of gently sloping vegetative cover that runoff water flows through before entering a stream, storm sewer, or other conveyance. They act as living sediment filters that intercept and detain stormwater runoff. They reduce the flow and velocity of surface runoff, promote infiltration, and reduce pollutant discharge by capturing and holding sediments and other pollutants carried in the runoff water. Vegetative buffer strips function much like vegetated or grassed swales. Buffer strips, however, are fairly level and treat sheet flow across them, whereas grassed swales are indentations that treat concentrated flows running along them.

### ***Material Specifications***

- Vegetative buffer strips may be of undisturbed natural vegetation or it can be graded and planted areas.

### ***Placement***

- May be placed at many locations between the source of sediment (road surface, side slopes) and a natural or constructed waterway. They are inexpensive and easily constructed, and can be put into place at any time if climatic conditions allow for planting.
- May be used at almost any site that can support vegetation, but is best suited for areas where the soils are well drained or moderately well drained and where the bedrock and the water table are well below the surface.

### ***Proper Installation Method***

- A buffer strip should be at least 20 ft wide to function well. Along live streams or above wetlands, the minimum width should be 100 ft. The length of the strip should be approximately 50 to 82 ft. Where slopes become steeper, increase the length of the strip.
- Tall, dense stands of grass form good sediment traps, as do willows and alder. The willows and alder can be native or planted. A combination of grasses with willows or alder is also effective. Any planted species should be deep rooted and able to adjust to low oxygen levels. Vegetative cover should be at least 75% to assure adequate removal of sediments. Forested strips are always preferred to vegetated strips, and existing vegetation is preferred to planted vegetation. In planning for vegetated strips, consider climatic conditions, since vegetation may not take hold in especially dry and/or cold regions.

#### ***List of Common Placement/Installation Mistakes to Avoid***

- In many cases, a vegetative buffer strip will not effectively control runoff and retain sediments unless employed in conjunction with other control measures. Where heavy runoff or large volumes of sediment are expected, provide diversion measures or other filtering measures above or below the buffer strip.
- Not effective for filtering high velocity flows from large paved areas, steep slopes, or hilly areas. Consider other measures if slopes exceed 15%.
- Do not use planted or seeded ground as a buffer strip for sediment trapping until the vegetation is well established.

#### ***Inspection and Maintenance***

Inspect the buffer strip at regular intervals to ensure proper functioning. Check for damage by equipment and vehicles. In newly planted areas, check the progress of germination and plant growth, and arrange for fertilizing, if needed, to enhance growth and establishment. (Planted ground should not be used for a sediment trap until the vegetation is well established.) Make sure that water flowing through the buffer strip is not causing additional erosion nearby and not forming ponds due to erosion within the buffer strip.

Buffer strips in natural vegetation do not generally require maintenance; however, on some sites it may be necessary to remove sediments and replant on a regular basis. Promptly repair any damage from equipment, vehicles, or erosion.

## Appendix 4 – Silt Fence Check Dams

### *Purpose and Operation*

Silt fence ditch checks operate by intercepting, ponding, and filtering sediment-laden runoff. Ponding the water reduces the velocity of the incoming flow and allows most of the suspended sediment to settle. As the ponded water percolates through the silt fence fabric, much of the remaining suspended sediment is filtered out. Silt fence ditch checks work well in ditches with low flows and moderate slopes.

### *Material Specifications*

- Silt fence fabric should conform to the AASHTO M288 96 silt fence specification.
- The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2-inches square, 4-feet long.  
**NOTE:** For structural stability, metal posts should be used in areas that will pond water.
- Silt fence fabric should be attached to the wooden posts with staples, wire, zip ties or nails.

### *Placement*

- Place silt fence in ditches where it is unlikely to be overtopped. Water should flow through a silt fence ditch check, not over it. Silt fence ditch checks often fail when overtopped.
- Silt fence ditch checks should be placed perpendicular to the flowline of the ditch.
- The silt fence should extend far enough so that the ground level at the ends of the fence is higher than the top of the low point of the fence. This prevents water from flowing around the check.
- Silt fence checks should not be placed in ditches where high flows are expected. Rock checks should be used instead.
- Silt fence should be placed in ditches with slopes of 6 percent or less. For slopes steeper than 6 percent, rock checks should be used.

The following table provides check spacing for a given ditch grade:

Ditch Check Dam Spacing	
Ditch Grade (percent)	Check Spacing (feet)
1	200
2	98
3	66
4	49
5	39
6	10
>6	*

\* Use other methodology

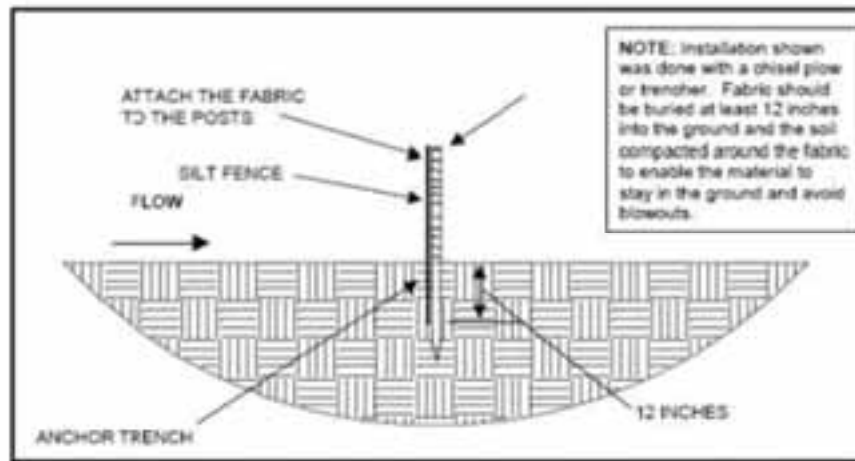


Figure A4-1 - Side View - Silt Fence Ditch Check.

#### Proper Installation Method

- Perpendicular to the ditch flowline, excavate a trench that is at least 6-inches deep by 4-inches wide. Extend the trench in a straight line along the entire length of the proposed ditch check. Place the soil on the upstream side of the trench for later use. **Note:** Another common and less labor-intensive installation method uses a trencher or chisel plow to install the silt fence. The silt fence will last longer and is less likely to blowout underneath.
- Roll out a continuous length of silt fence fabric on the downstream side of the trench. Place the edge of the fabric in the trench starting at the top upstream edge of the trench. Line all three sides of the trench with the fabric. Backfill over the fabric in



the trench with the excavated soil, and compact. After filling the trench, approximately 24-inches to 36-inches of silt fence fabric should remain exposed.

- Lay the exposed silt fence on the upstream side of the trench to clear an area for driving in the posts. Just downstream of the trench, drive posts into the ground to a depth of at least 24-inches. Place posts no more than 4-feet apart.
- Attach the silt fence to the anchored post with staples, wire, zip ties or nails.

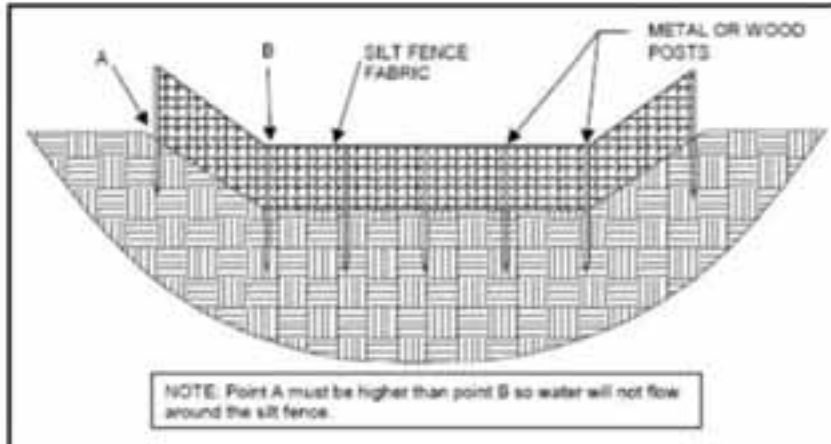


Figure A4-2 - Elevation View - Silt Fence Ditch Check

#### *List of Common Placement/Installation Mistakes to Avoid*

- Water should flow through a silt fence ditch check, not over it. Place silt fence in ditches where it is unlikely to be overtopped. Silt fence installations quickly deteriorate when water overtops them.
- Do not place silt fence posts on the upstream side of the silt fence fabric. In this configuration, the force of the water is not restricted by the posts, but only by the staples (wire, zip ties, nails, etc.). The silt fence will rip and fail.
- Do not place a silt fence ditch check directly in front of a culvert outlet. It will not stand up to the concentrated flow.
- Do not place silt fence ditch checks in ditches that likely will experience high flows. They will not stand up to concentrated flow.
- Follow prescribed ditch-check spacing guidelines. If spacing guidelines are exceeded, erosion will occur between the ditch checks.
- Do not allow water to flow around the ditch check. Make sure that the ditch check is long enough so that the ground level at the ends of the fence is higher than the low point on the top of the fence.

- Do not place silt fence ditch checks in channels with shallow soils underlain by rock. If the check is not anchored sufficiently, it will wash out.

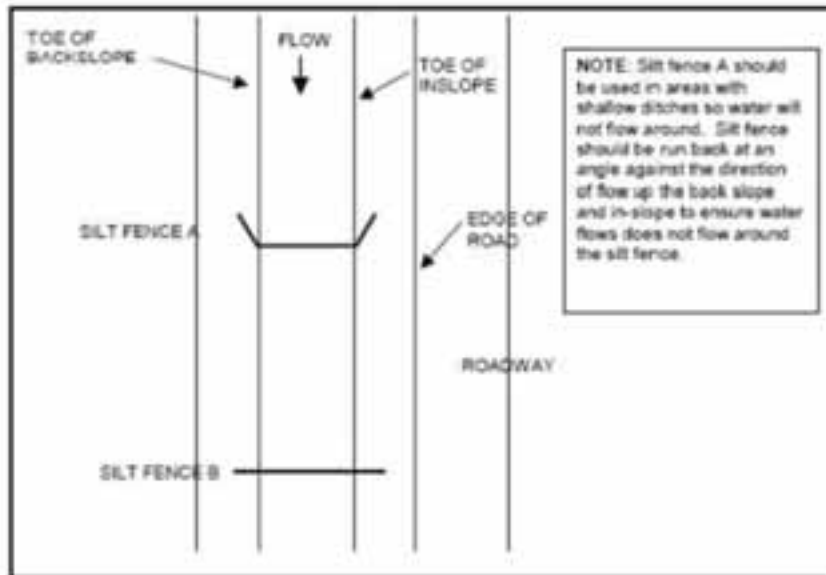


Figure A4-3 - Placement of silt fence

#### Inspection and Maintenance

Silt fence ditch checks should be inspected every fourteen days and within 24-hours of a rainfall of 0.5-inch or more. The following questions should be addressed during each inspection:

- Does water flow around the ditch check?

Water flowing around the ditch check usually is caused by insufficient ditch check length. If this occurs, lengthen the check so that the ground level at the ends of the fence is higher than the low point on the top of the center of the fence.

- Does water flow under the ditch check?

Water flowing under the ditch check can be caused by posts that are too far apart, a trench that is too shallow, or an improper burial procedure. Posts should be no more than 4-feet apart. The trench should be at least 4-inches wide by 6-inches deep. The bottom edge of the silt fence should be anchored securely by backfilling over the fabric in the trench with the excavated soil and then compacting. If these guidelines have not been met, the silt fence ditch check should be reinstalled or the deficiencies remedied.

- **Does the silt fence sag excessively?**

Sagging silt fence is caused by excessive post spacing and/or overtopping of the silt fence. Silt fence posts should be no more than 4-feet apart. If the post spacing exceeds 4-feet; additional posts should be added to decrease spacing between posts. Water should flow through a silt fence ditch check, not over it. Silt fence installations deteriorate quickly when the water overtops them.

If a silt fence ditch check is regularly overtopped, it probably has been placed in a location that receives flows beyond its intended capacity. In this case, discontinue the use of silt fence in this area and try something different (e.g., rock ditch checks).

- **Has the silt fence torn or become detached from the posts?**

Silt fence can be torn by the force of ponded water or by winds that rip the silt fence fabric away from the posts. If a silt fence develops tears for any reason, it should be replaced.

- **Does sediment need to be removed from behind the ditch check?**

Sediment accumulated behind the ditch check should be removed when it reaches one-half of the original exposed height of the silt fence. Allowing too much sediment to accumulate behind a ditch check drastically reduces its effectiveness. Because one high-intensity rainfall can dislodge enough sediment from surrounding slopes to completely fill the space behind the ditch check, it is extremely important to inspect ditch checks within 24-hours of a heavy rainfall.

**Note** – When removing sediment from behind a silt fence ditch check with a bulldozer or backhoe, take care not to undermine the entrenched silt fence.

## Appendix 5 – Rock Ditch Check Dams

### *Purpose and Operation*

Rock ditch checks operate by intercepting and ponding sediment-laden runoff. Ponding the water dissipates the energy of any incoming flow and allows a large portion of the suspended sediment to settle. Water exits the ditch check by flowing over its crest. Rock ditch checks are ideal for ditches that eventually will have a riprap lining. Upon completion of the project, rock ditch checks can be spread out to form a riprap lined channel.

### *Material Specifications*

Rock ditch checks should be constructed of stone that is between 4-inches to 8-inches in size. Field or quarry stone is acceptable; however, sand stone is not.

### *Placement*

- Rock ditch checks should be perpendicular to the flowline of the ditch.
- Rock ditch checks must be designed so that water can flow over them, not around them. The ditch check should extend far enough so that the ground level at the ends of the check is higher than the low point on the crest of the check.
- Rock ditch checks are best located in ditches that eventually will be lined with riprap, so that the rock will not have to be removed at the completion of construction. The following table provides check spacing for a given ditch grade:

Ditch Check Dam Spacing	
Ditch Grade (percent)	Check Spacing (feet)
5	59
6	49
7	43
8	36
9	33
10	30

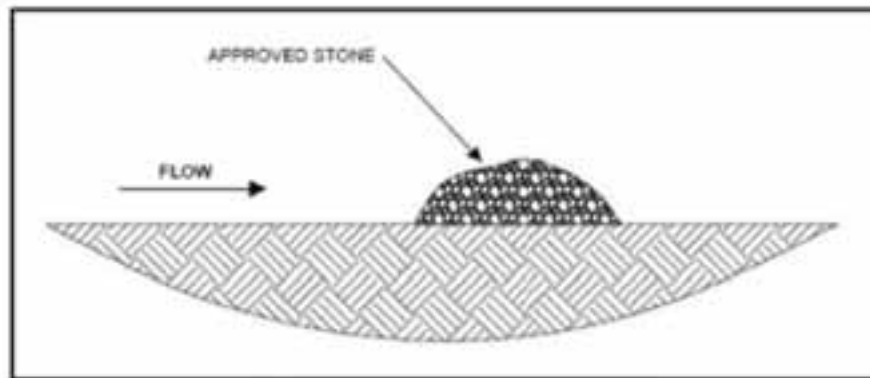


Figure A5-1 - Side View - Rock Ditch Check

**Proper Installation Method**

- Using approved stone, construct a rock ditch check perpendicular to the ditch flowline. The ditch check should be 18-inches to 24-inches high and have side slopes no steeper than 1:1. The rock ditch check must be constructed so that water can flow over the top, not around the ends (i.e., the ground level at the ends of the check must be higher than the low point on the crest of the check).

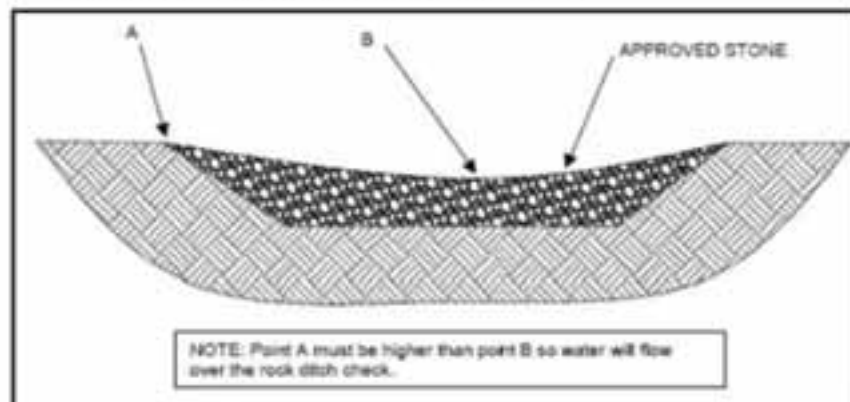


Figure A5-2 - Elevation View - Rock Ditch Check

**List of Common Placement/Installation Mistakes to Avoid**

- Follow prescribed ditch check spacing guidelines. If spacing guidelines are exceeded, erosion will occur between the ditch checks.
- Do not allow water to flow around the ditch check. Make sure that the ditch check is long enough so that the ground level at the ends of the check is higher than the low point on the crest of the check.



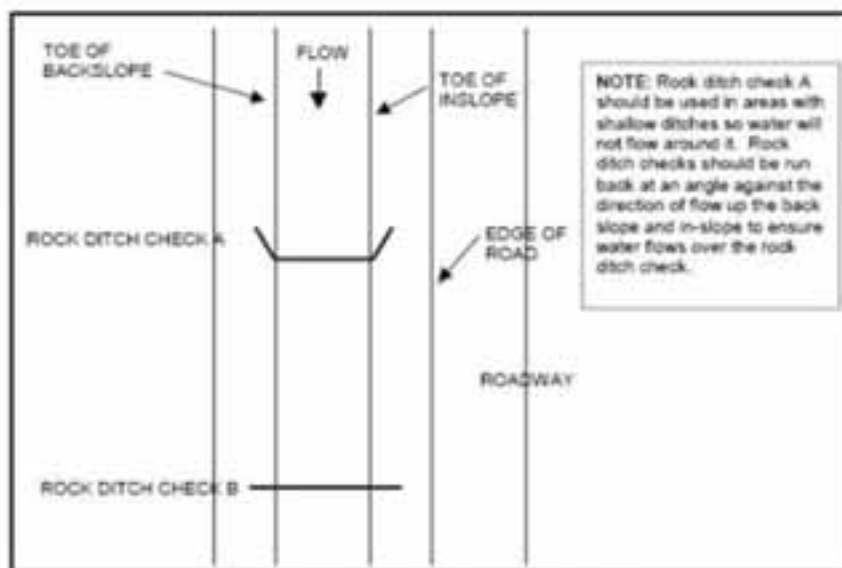


Figure A5-3 - Placement of Rock Ditch Check

#### *Inspection and Maintenance*

Rock ditch checks should be inspected every fourteen days and within 24-hours of a rainfall of 0.5-inches or more. The following questions should be addressed during each inspection:

- **Does water flow around the ditch check?**

Water flowing around the ditch check usually is caused by insufficient ditch check length. If this occurs, extend the check a sufficient length so that the ground level at the ends of the check is higher than the low point on the crest of the check.

- **Have high-velocity flows displaced any stones from the check?**

Sometimes high-velocity flows can carry away portions of a rock ditch check. After a heavy rainstorm, inspect the rock ditch check for any displaced stones. If a large portion of a rock ditch check has washed away, fill in the void with new stone immediately.

- **Does sediment need to be removed from behind the ditch check?**

Sediment accumulated behind the ditch check should be removed when it reaches one-half of the original exposed height of the rock ditch check. Allowing too much sediment to accumulate behind a ditch check drastically reduces its effectiveness. Because one high-intensity rainfall can dislodge enough sediment from surrounding slopes to completely fill the space behind the ditch check, it is extremely important to inspect ditch checks within 24-hours of a heavy rainfall.

**Note** – The easiest way to remove sediment from behind a rock ditch check is with a bulldozer or backhoe.

## **Appendix 6 – Straw Roll Ditch Check Dams**

### ***Purpose and Operation***

Straw roll ditch checks operate by intercepting, ponding, and filtering sediment-laden runoff. Ponding the water reduces the velocity of the incoming flow and allows most of the suspended sediment to settle. As the ponded water percolates through the straw roll, much of the remaining suspended sediment is filtered out. Straw roll ditch checks work well in ditches with low flows and moderate slopes.

### ***Material Specifications***

- Straw rolls are made from straw that is wrapped in tubular mesh netting. They are usually about 8 inches in diameter and 20-25 feet long.
- Biodegradable or photodegradable mesh netting may be preferential in order to reduce the need to remove the straw rolls after revegetation has been completed.
- Wooden stakes should be approximately 3/4 x 3/4 x 24 inches. Willow cuttings or 3/8-inch rebar can also be used for stakes.

### ***Placement***

- Place straw rolls in ditches where it is unlikely to be overtopped. Water should flow through a straw roll ditch check, not over it. However, if properly installed, they can handle minor overtopping.
- Straw roll ditch checks should be placed perpendicular to the flowline of the ditch.
- The straw rolls should extend far enough so that the ground level at the ends of the straw roll is higher than the top of the low point of the straw roll. This prevents water from flowing around the check.
- Straw roll checks should not be placed in ditches where high flows are expected. Rock checks should be used instead.
- Straw rolls should be placed in ditches with slopes of 6 percent or less. For slopes steeper than 6 percent, rock checks should be used.

The following table provides check spacing for a given ditch grade:

<b>Ditch Check Dam Spacing</b>	
<b>Ditch Grade (percent)</b>	<b>Check Spacing (feet)</b>
1	200
2	98
3	66
4	49
5	39
6	10
>6	*

\* Use other methodology

#### ***Proper Installation Method***

- It is critical that straw rolls are installed perpendicular to the flow direction and parallel to the slope contour.
- Narrow trenches should be dug across the channel to a depth of 3 to 5 inches on clay soils and soils with gradual slopes. On loose soils, steep slopes, and areas with high rainfall, the trenches should be dug to a depth of 5 to 7 inches, or 1/2 to 2/3 of the thickness of the straw roll.
- Start building trenches and installing straw rolls across the channel, making sure that the ends are higher than the top of the straw roll at its lowest point.
- If possible, avoid butting straw rolls in a channel.
- Install stakes at each end of the straw roll, and at 4-foot centers along entire length of straw roll.
- If required, install pilot holes for the stakes using a straight bar to drive holes through the straw roll and into the soil.
- At a minimum, wooden stakes should be approximately 3/4 x 3/4 x 24 inches. Willow cuttings or 3/8-inch rebar can also be used for stakes.
- Stakes should be driven through the middle of the straw roll, leaving 2 to 3 inches of the stake protruding above the straw roll.

#### ***List of Common Placement/Installation Mistakes to Avoid***

- Do not place a straw roll ditch check directly in front of, or below a culvert outlet. It will not stand up to the concentrated flow.
- Do not place straw roll ditch checks in ditches that likely will experience high flows. They will not stand up to concentrated flow.

- Follow prescribed ditch-check spacing guidelines. If spacing guidelines are exceeded, erosion will occur between the ditch checks.
- Do not allow water to flow around the ditch check. Make sure that the ditch check is long enough so that the ground level at the ends of the fence is higher than the low point on the top of the fence.
- Do not place straw roll ditch checks in channels with shallow soils underlain by rock. If the check is not anchored sufficiently, it will wash out.

#### ***Inspection and Maintenance***

Straw roll ditch checks should be inspected every fourteen days and within 24-hours of a rainfall of 0.5-inch or more. The following questions should be addressed during each inspection:

- **Does water flow around the ditch check?**

Water flowing around the ditch check usually is caused by insufficient ditch check length. If this occurs, lengthen the check so that the ground level at the ends of the straw roll is higher than the low point on the top of the center of the straw roll.

- **Does water flow under the ditch check?**

Water flowing under the ditch check can be caused by inadequate staking of the straw rolls, or improper trenching. Ensure that the straw roll is making good contact with the ground, and is trenched in with any extra fill placed on the upstream side of the straw roll.

- **Does sediment need to be removed from behind the ditch check?**

Sediment accumulated behind the ditch check should be removed when it reaches one-half of the original exposed height of the silt fence. Allowing too much sediment to accumulate behind a ditch check drastically reduces its effectiveness. Because one high-intensity rainfall can dislodge enough sediment from surrounding slopes to completely fill the space behind the ditch check, it is extremely important to inspect ditch checks within 24-hours of a heavy rainfall.

**Note** – When removing sediment from behind a straw roll ditch check with a bulldozer or backhoe, take care not to undermine the entrenched straw roll.

## Appendix 7 – Diversion Trenches

### *Purpose and Operation*

Diversion trenches collect and direct road surface and roadside ditch runoff from one or both sides of the road away from the roadway and into undisturbed areas adjacent to the road.

### *Material Specifications*

- Diversion trenches are generally constructed out of existing soil on the site.

### *Placement*

- Diversion trenches should be used where surface runoff on roads can accumulate to a point where it can cause erosion.
- A ditch check dam immediately downstream of the trench entrance will divert water into the diversion trench.
- Spacing of the diversion trenches decreases as the hill slope steepens. The following table provides recommended spacing:

Diversion Trench Spacing	
Slope (%)	Spacing (ft)
< 5	125
5 to 10	100
10 to 20	75
20 to 35	50
> 35	25

### *Proper Installation Method*

- The diversion trench should intersect the ditch line at the same depth as the ditch line and have a low gradient outslope.
- On sloping roads, the diversion trench should leave the road ditch line at a 30 to 45 degree angle to the roadbed and be designed to follow the natural slope contour.
- Runoff water should be spread out of the end of the trench on an area that is not susceptible to erosion.

### *List of Common Placement/Installation Mistakes to Avoid*

- Do not direct runoff from a diversion trench to flow directly into an adjacent drainage, gully, or channel.

### *Inspection and Maintenance*

Diversion trenches should be inspected every fourteen days and within 24-hours of a rainfall of 0.5-inches or more. The following questions should be addressed during each inspection:



- **Are there any points along the diversion trench that water is collecting?**

If water is collecting along the diversion trench it may need to be changed to have a slight downhill gradient that allows water to flow to the outlet of the trench.

- **Has the diversion trench been eroded or downcut?**

If erosion has occurred on the trench it will need to be repaired. The site should be evaluated to determine if additional runoff control methodology should be employed.

- **Has sediment collected in the trench?**

If sediment has collected in the trench, it may need to be removed.

**Note** – When removing sediment from a diversion trench with a bulldozer or backhoe, take care not to undermine the diversion trench.

## Appendix 8 – Road Drainage Dips

### *Purpose and Operation*

The primary purpose of a drainage dip is to intercept and remove surface water from the travel-way and shoulders before the combination of water volume and velocity begins to erode the surface materials. Drainage dips should not be confused with water bars, which are normally used for drainage and erosion protection of closed or blocked roads. See Figure 10-1 for illustration and construction specifications. Spacing of drainage dips depends upon local conditions such as soil material, grade, and topography.

### *Material Specifications*

Drainage dips will be constructed out of the same material as the road base.

### *Placement and Installation*

See Figure A8-1.

### *Inspection and Maintenance*

Road drainage dips should be inspected every fourteen days and within 24-hours of a rainfall of 0.5-inches or more. The inspector should check for erosion of the drainage dip.

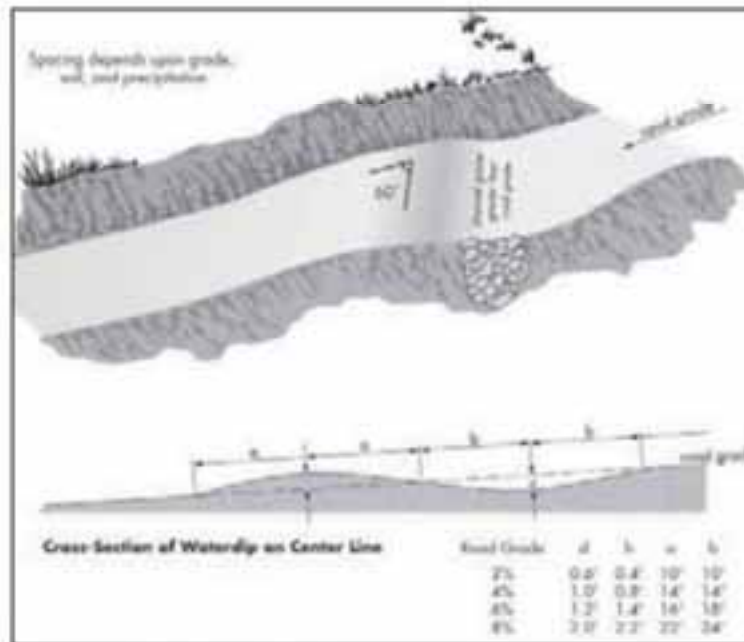


Figure A8-1 - Plan and Cross-Section Views - Road Drainage Dip

## Appendix 9 – Ditch Relief Culverts

### *Purpose and Operation*

Ditch relief culverts are installed to periodically relieve the ditch line flow by piping water to the opposite side of the road where the flow can be dispersed away from the roadway.

### *Material Specifications*

Culverts should have a minimum diameter of 12-inches. The diameter should be determined by the anticipated amount of water that would flow through the culvert. Factors to be considered include the geographic area being drained, soils and slopes in the drainage area, annual precipitation, and likely storm events.

The outlet of all culverts should extend at least 1-foot beyond the toe of any slope. It may be necessary to install rip-rap or other energy dissipation devices at the outlet end of the culvert to prevent soil erosion or trap sediment.

All culverts used in construction of access roads should be concrete, corrugated metal pipe (CMP) made of steel, or properly bedded and backfilled corrugated plastic pipe. Only undamaged culverts are to be used, and any culvert should be inspected for damage prior to installation. All spots on the pipes where the zinc coating has been injured should be painted with two coats of zinc-rich paint.

### *Placement*

Ditch relief culverts can provide better flow when skewed with an entrance angle of 45 to 60 degrees with the side of the ditch. The culvert gradient should be greater than the approach ditch gradient. This improves the flow hydraulics and reduces siltation and debris plugging the culvert inlet. Culverts placed in natural drainages can also be utilized for ditch relief.

Maximum Recommended Relief Culvert Spacing (ft)			
Soil Type	Road Grade		
	2-4%	5-8%	9-12%
Highly Erosive Granitic or Sandy	240	180	140
Intermediate Erosive Clay or Loam	310	260	200
Low Erosive Shale or Gravel	400	325	250

### *Proper Installation*

The depth of culvert burial must be sufficient to ensure protection of the culvert barrel for the design life of the culvert. This requires anticipating the amount of material that may be lost due to road use and erosion.

### *Inspection and Maintenance*

Relief culverts should be inspected every fourteen days and within 24-hours of a rainfall of 0.5-inches or more. The inspector should check for erosion around both ends of the culvert, or for blockage by debris.

## **Appendix 10 – Low Water Crossings**

### ***Purpose and Operation***

Roads may cross small drainages and intermittent streams where culverts and bridges are unnecessary. Properly constructed low water crossings will minimize sediment movement caused by vehicles driving across stream channels. The crossing can be effectively accomplished by dipping the road down to the bed of the drainage. Site-specific designs and the construction of gravel, rip-rap, or concrete bottoms may be required in some situations. In no case should the drainage be filled so that water will be impounded. Low water crossings that are not surfaced should not be used in wet conditions.

### ***Material Specifications***

Use river rock with a D<sup>50</sup> of 6-inches. Areas susceptible to severe erosion may require underlayment of geotextile.

### ***Placement***

Rock will be placed across the stream channel beyond the bankfull width. Steep side slopes should be avoided.

### ***Proper Installation***

Minor excavation of the channel bottom may need to be done such that rock can be installed in a manner that will not allow water to pool on the upstream side of the crossing.

### ***Inspection and Maintenance***

Low water crossings should be inspected every fourteen days and within 24-hours of a rainfall of 0.5-inches or more. The inspector should check for erosion at the crossing, debris around the crossing, and that rock has not been transported downstream.

## Appendix 11 – Erosion Control Matting

### *Purpose and Operation*

Erosion-control blankets are used to help limit erosion and establish vegetation on slopes and in ditches where conventional seeding and/or structural methods would be inadequate. By reducing the negative effects of rainfall impact and runoff, erosion-control blankets provide slopes and ditches with a temporary, stable environment for seed to germinate. Erosion-control blankets are constructed of a variety of materials, including straw, wood excelsior, coconut or some combination thereof. These materials usually are stitched or glued to some type of synthetic or natural fiber netting that is either biodegradable or photodegradable (broken down by light).

### *Material Specifications*

- Selection of Erosion-Control Blankets will depend on the actual soil and hydraulic conditions. Longevity and stress level characteristics are dependent on material composition.

#### **Geotextiles:**

- **Jute Mesh:** Made of plant fibers, which are separated and woven into the jute mesh product. This product is totally biodegradable, the product generally lasts up to one year. Jute is very useful in low rainfall areas because it absorbs more moisture. This product is very useful for wind erosion in many arid and semi arid locations where wind erosion can cause considerable erosion.
- **Coir Blankets:** Manufactured from coir, the husk of coconut. (Biodegradable netting configurations.) Coir blankets are designed to last up to two to three years. This option is useful in areas where vegetation will take longer to establish. Poor soil conditions, sloped areas, etc. This product is very useful for wind erosion in many arid and semi arid locations where wind erosion can cause considerable erosion.
- **Excelsior Blankets:** This product is available in single or double net configurations. (Biodegradable netting configurations.) Single net excelsior blankets will be used on slope less than 2:1 or in channel flows of less than 5.5-feet per second. The double net product will be installed on slopes up to 1:1 and a channel flow velocity of 7-feet per second.
- **Geotextiles, also called geosynthetics,** are generally associated with high-standard all-season roads, but can be used in low-standard access roads.

Geotextiles extend the service life of roads, increase their load-carrying capacity, and reduce the incidence of ruts and erosive conditions. These benefits are accomplished by separating aggregate structural layers from subgrade soil while allowing the passage of water.

In both the filtration and separation functions, water is permitted to pass through the geotextile. Occasionally, some confusion arises between the separation and filtration functions in this regard. A distinction may be drawn between the two with respect to



the quantity of water involved and the degree to which it influences geotextile selection.

In the filtration function, the volume of water moving through the fabric is a key design element specifically addressed in the design and selection of the geotextile. It must be able to convey a certain quantity of water across the plane of the fabric throughout its design life to prevent the buildup of water pressure.

This is typically not the case with a geotextile used for separation. While water may pass in either direction across the plane of the geotextile, it is not typically an element of design as the quantities of water are relatively small, even in those cases of high groundwater and saturated subgrades.

#### ***Placement***

- The erosion-control blankets should be used in areas of high flow and/or steep slopes where erosion will occur before grass growth.
- The blankets also should be placed in areas where poor soil quality hinders normal grass growth.

#### ***Proper Installation***

- Prepare the soil and apply the seed before installing blankets.
- Anchor the blankets into a 6-inch x 6-inch trench. Backfill and compact the trench after stapling the blanket in accordance with the manufacture's recommendations.
- Roll out the blanket in the direction of flow.
- Overlap the ends of the blanket if additional rolls are needed. Place the upstream blanket on top of the new roll and staple. Use a double row of staples staggered 4-inches apart. A minimum overlap of 1-foot is required.
- Continue to place blankets in the above fashion, remembering to overlap all edges.
- The terminal end of the blankets must be anchored as stated above.
- Refer to the manufacture's recommendations for the number of staples to be placed per square yard based on slope and flow characteristics.

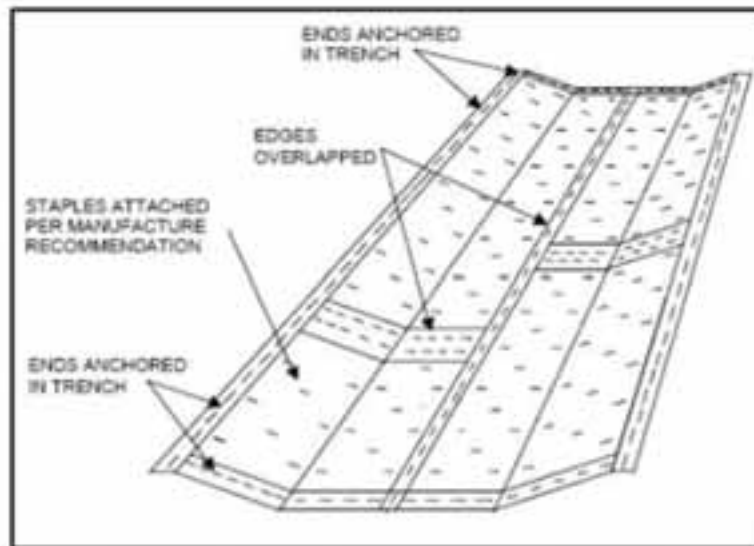
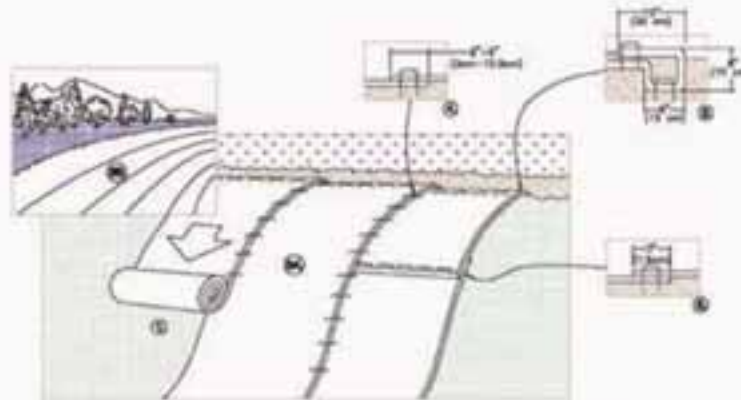


Figure A11-1 - Plan View - Temporary Erosion-Control Blanket

## EROSION CONTROL SLOPE INSTALLATION



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-G-SEDS DO NOT SEED PREPARED AREA. CELL-G-SEDS MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 4' (1.2m) DEEP X 4' (1.2m) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF BLANKET EXTENDING BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30cm) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH WITH SOIL. APPLY SEED TO COMPACTED SOIL AND SOIL REMAINING 12" (30cm) PORTION OF BLANKET OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROXIMATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL LIFT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF ADJACENT BLANKETS MUST BE STAPLED WITH APPROXIMATELY 4" x 4" (1.2m x 1.2m) OVERLAP EXTENDING ON BLANKET (B). TO UNROLL FURTHER DOWN SLOPE, PLACE THE END OF THE OVERLAPPING BLANKET (BLANKET B) BEING INSTALLED ON TOP OF END WITH THE COLORED SCAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPUNED DOWN THE SLOPE MUST BE PLACED END OVER END (OVERLAP STAPLES) WITH AN APPROXIMATE 4" (1.2m) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30cm) APART ACROSS ENTIRE BLANKET WIDTH.

NOTE:  
ON LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 4" (1.2m) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

Figure A11- 2- Erosion Control Slope Installation

### List of Common Placement/Installation Mistakes to Avoid

- Ensure the ends are properly secured.
- Install a sufficient number of staples to hold the blanket in place.
- Overlap the blanket to ensure water that flows on top of the blanket and is unable to flow under the blanket.

### ***Inspection and Maintenance***

Temporary erosion-control blankets should be inspected every fourteen days and within 24-hours of a rainfall of 0.5-inches or more. The following questions should be addressed during each inspection:

- **Are the ends pulled out?**

Pulled out ends are usually caused by not properly installing them. Repeat the anchoring procedures for the ends, installing additional staples or increasing the trench size as necessary to ensure that the installation is secure.

- **Are the seams together?**

If the seams are pulled apart, the blanket was not properly installed. Reinstall at the seams, adding more staples if necessary to hold the material in place.

- **Is the blanket sagging or misplaced?**

A sagging or misplaced blanket usually is caused by lack of staples. Reinstall the blanket, using the correct number of staples.

**Note** – If at all possible, use a biodegradable or photodegradable erosion-control blanket. Using this type of product, will save money because the blanket can be left in place. No additional time or resources will have to be exhausted to remove the material.

## **Appendix 12 – Seeding and Mulch**

### ***Purpose and Operation***

Mulching is done primarily with Hydro-mulch or straw. Mulching involves the application of straw or other organic materials to form a temporary, protective soil cover. Mulch protects the soil surface from the forces of raindrop impact and overland flow. Organic mulches foster the growth of vegetation, reduce evaporation, insulates the soil, and suppresses weed growth.

Seeding promotes the quick establishment of vegetation, which is the ultimate goal of the SWPPP.

### ***Material Specification***

- At least 50% of hay or straw mulch by weight should be 10 inches or more in length.
- Straw mulch material should consist of native hay or the straw from oats or barley, and should be seed free to prevent introduction of weeds.
- Hydro-mulch contains a wood cellulose fiber that has not been treated with any germination or growth inhibitive substance but will be treated with a tackifier to enhance seed and mulch placement and adherence to the soil. The mulch should be free of contamination from noxious weed seed and seed from competitive plants.
- Seed should be weed free.
- Seed should most often be native perennial species that grow quickly and develop strong roots.

### ***Placement and Installation***

- The mulch should be machine blown and should be uniformly distributed over the seeded areas. The machine should be of a design that minimizes cutting or breaking of the mulching material.
- Mulching operations should not be performed during periods of excessively high winds, which would preclude the proper placing of the mulch.
- Straw mulch containing excessive moisture which prevents uniform feeding through the machine should not be used.
- Straw bales should be broken up and loosened as they are fed into the blower to avoid placement of matted or unbroken lumps.
- The mulch should be placed within 24 hours after the seeding has been completed.
- Straw mulch should be placed uniformly over the seeded areas at the rate of 2 tons per acre.
- Approximately 10% of the soil surface should be visible through straw mulch blanket before the mulch tiller (punching) operation.



- Hydro mulch should be uniformly applied at a rate of one ton per acre and should cover a minimum of 95% of the seedbed area. After application, the mulch should permit percolation of water to the underlying soil.
- Seed should be raked into the topsoil and spread at a rate recommended by the seed distributor.

#### ***Inspection and Maintenance***

Mulched areas should be inspected every fourteen days and within 24-hours of a rainfall of 0.5-inches or more. The following questions should be addressed during each inspection:

- **Are there any rills or gullies forming?**  
If rills or gullies are forming on a slope the area may need regrading and reseeding along with additional erosion controls.
- **Are there any bare soil patches?**  
If there are bare soil patches, the areas may need additional mulch and seed.
- **Is there any sediment at the toe of the slope?**  
If there is sediment at the toe of a slope the area may need regrading and reseeding along with additional erosion controls.

## **Appendix 13 – Vegetated Channels**

### ***Purpose and Operation***

A vegetated channel conveys stormwater runoff through a stable conduit. Vegetation in the channel slows down concentrated runoff. Because grassed channels are not usually designed to control peak runoff loads by themselves, they are often used with other BMPs.

Where moderately steep slopes require drainage, grassed channels can include excavated depressions or check dams to enhance runoff storage, decrease flow rates, and improve pollutant removal. Peak discharges can be reduced by temporarily holding them in the channel. Pollutants can be removed from stormwater by filtration through vegetation, by deposition, or in some cases by infiltration of soluble nutrients into the soil. The degree of pollutant removal in a channel depends on how long the water stays in the channel and the amount of contact with vegetation and the soil surface. Local conditions affect the removal efficiency.

### ***Material Specifications***

- Native grass or vegetation with deep roots. Fast growing, annual grass varieties can be used on conjunction with perennial varieties.

### ***Proper Installation Method***

- Construct and vegetate the channel before grading and paving activities begin.
- Make sure design velocities are less than 5 feet per second.
- Consider using geotextiles to stabilize vegetation until it is fully established.
- Consider covering the bare soil with sod, mulches with netting, or geotextiles to provide reinforced stormwater conveyance immediately.
- Use triangular channels with low velocities and small quantities of runoff; use parabolic grass channels for larger flows and where space is available; use trapezoidal channels with large, low-velocity flows (low slope).
- Install outlet stabilization structures if the runoff volume or velocity might exceed the capacity of the receiving area.
- Slope the sides of the channel less than 2:1; slope triangular channels along roads 2:1 or less for safety.
- Remove all trees, brushies, stumps, and other debris during construction.

### ***List of Common Placement/Installation Mistakes to Avoid***

- Do not place any equipment, construction debris, or extra soil in the buffer strip

#### ***Inspection and Maintenance***

Inspect the buffer strip at regular intervals to ensure proper functioning. Check for damage by equipment and vehicles. In newly planted areas, check the progress of germination and plant growth, and arrange for fertilizing, if needed, to enhance growth and establishment. (Planted ground should not be used for a sediment trap until the vegetation is well established.) Make sure that water flowing through the buffer strip is not causing additional erosion nearby and not forming ponds due to erosion within the buffer strip.

Buffer strips in natural vegetation do not generally require maintenance; however, on some sites it may be necessary to remove sediments and replant on a regular basis. Promptly repair any damage from equipment, vehicles, or erosion.

## Appendix 14 – Silt Fence Slope Barriers

### *Purpose and Operation*

Silt fence slope barriers operate by intercepting and ponding sediment-laden slope runoff. Ponding the water reduces the velocity of the incoming flow and allows most of the suspended sediment to settle. Water exits the silt fence slope barrier by percolating through the silt fence.

### *Material Specification*

- The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2-inches square (nominal) by 4-feet long. **Note:** For structural stability metal posts should be used in areas where water will pond.
- Silt fence fabric should be attached to the wooden posts with staples, wire, zip ties or nails.

### *Placement*

- A slope barrier should be used at the toe of a slope when a ditch does not exist. The slope barrier should be placed on nearly level ground 5-feet to 10-feet away from the toe of a slope to provide adequate storage for settling sediment.
- When practicable, silt fence slope barriers should be placed along contours to avoid concentrated flows.
- Silt fence slope barriers also can be placed along right-of-way fence lines to keep sediment from crossing onto adjacent property. When placed in this manner, the slope barrier will not likely follow contours.

### *Proper Installation Method*

- Along the length of the planned slope barrier excavate a trench that is 6-inches deep by 4-inches wide. Make sure that the trench is excavated along a single contour. When practicable, slope barriers should be placed along contours to avoid a concentration of flow. Place the soil on the up-slope side of the trench for later use. **Note:** Using a trencher or chisel plow to install the silt fence is less labor intensive. The silt fence will last longer and is less likely to blowout underneath.
- Roll out a continuous length of silt fence fabric on the down-slope side of the trench. Place the edge of the fabric in the trench starting at the top up-slope edge. Line all three sides of the trench with the fabric. Backfill over the fabric in the trench with the excavated soil, and compact. After filling the trench, drive posts into the ground to a depth of at least 24-inches. Place posts no more than 4-feet apart.
- Attach the silt fence to the anchored post with staples, wire, zip ties or nails.

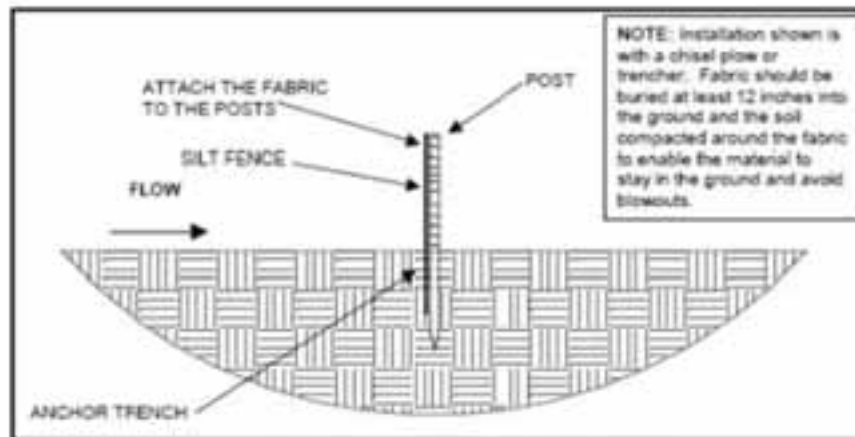


Figure A14-1 - Side View - Silt Fence Slope Barrier

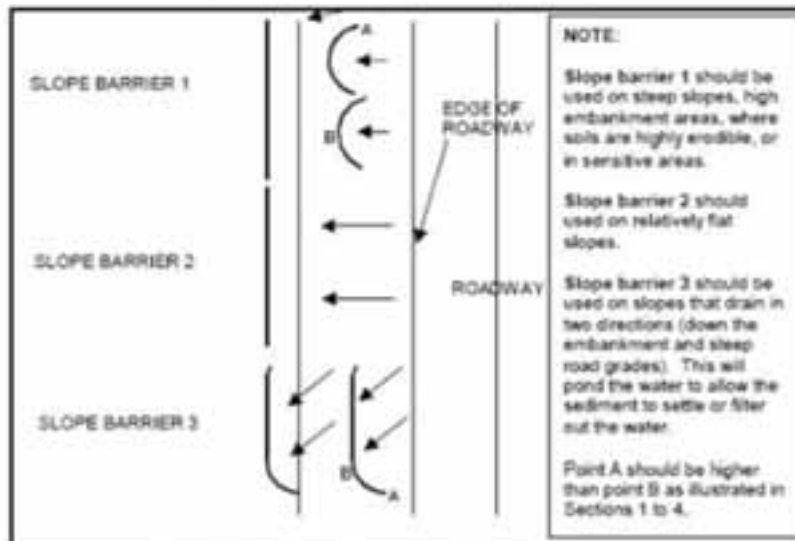


Figure A14-2 - Placement of Silt Fence Slope Barrier



#### ***List of Common Placement/Installation Mistakes to Avoid***

- When practicable, do not place silt fence slope barriers across contours. Slope barriers should be placed along contours to avoid concentration of flow. When the flow concentrates, it overtops the barrier, and the silt fence slope barrier quickly deteriorates.
- Do not place silt fence posts on the up-slope side of the silt fence fabric. In this configuration, the force of the water is not restricted by the posts, but only by the staples (wire, zip ties, nails, etc.). The silt fence will rip and fail.
- Do not place silt fence slope barriers in areas with shallow soils underlain by rock. If the barrier is not sufficiently anchored, it will wash out.
- Silt fence slope barriers must be dug into the ground; silt fence at ground level does not work because water will flow underneath.

#### ***Inspection and Maintenance***

Silt fence slope barriers should be inspected every fourteen days and within 24-hours of a rainfall of 0.5-inches or more. The following questions should be addressed during each inspection:

- **Are there any points along the slope barrier where water is concentrating?**

When slope barriers are not placed along contours, water concentrates at low points of the slope barrier. This concentrated flow usually causes a failure of the slope barrier. Even if the barrier does not fail, the concentration of flow drastically reduces the overall storage capacity of the slope barrier. The only solution to this problem is reinstalling the slope barrier (or sections of it) so that it is level.

- **Does water flow under the slope barrier?**

Water flowing under the slope barrier can be caused by posts that are too far apart, a trench that is too shallow, or an improper backfill procedure. Posts should be no more than 4-feet apart. The trench should be at least 4-inches wide by 6-inches deep. The bottom edge of the silt fence should be anchored securely by backfilling over the fabric in the trench with the excavated soil and then compacting. If these guidelines have not been met, the silt fence slope barrier should be reinstalled, or the deficiencies should be remedied.

- **Does the silt fence sag excessively?**

Sagging silt fence is caused by excessive post spacing and/or overtopping of the silt fence. Silt fence posts should be no more than 4-feet apart. If the post spacing exceeds 4-feet, additional posts should be added to decrease spacing between posts. Water should flow through a silt fence slope barrier, not over it. Silt fence installations quickly deteriorate when water overtops them. If a silt fence slope barrier is regularly overtopped, it has probably been placed in a location that receives flows beyond intended capacity. If this is the case, discontinue the use of silt fence in this area and try something different (e.g., straw roll slope barrier).

- **Has the silt fence torn or become detached from the posts?**

Silt fence can be torn by the force of ponded water, or by winds that rip the silt fence fabric away from the posts. If a silt fence develops tears for any reason, it should be replaced.

- **Does sediment need to be removed from behind the slope barrier?**

Sediment accumulated behind the slope barrier should be removed when it reaches one-half of the original exposed height of the silt fence. Allowing too much sediment to accumulate behind a slope barrier drastically reduces its effectiveness. Because one high-intensity rainfall can dislodge enough sediment from surrounding slopes to completely fill up the space behind the slope barrier, it is extremely important to inspect slope barriers within 24-hours of a heavy rainfall.

**Note** – When removing sediment from behind a silt fence slope barrier with a bulldozer or backhoe, take care not to undermine the entrenched silt fence.

## Appendix 15 – Water Bar Slope Barriers

### *Purpose and Operation*

Water bars operate by intercepting and ponding sediment-laden slope runoff. Ponding the water reduces the velocity of the incoming flow and allows most of the suspended sediment to settle. Water exits the water bar slope barrier by flowing over the bales.

### *Material Specification*

- Water bars are generally constructed out of the existing soil on the site.

### *Placement*

- A water bar should be used on a slope that has been subjected to surface disturbance where no concentrated preferential flow path is evident.
- Water bars should be placed along contours to avoid concentrated flow laterally along the uphill side of the water bar. Ideally, the entire length of each water bar should be at the same elevation.
- Spacing of the water bars decreases as the hill slope steepens. The following table provides recommended spacing:

Water Bar Spacing	
Slope (%)	Spacing (ft)
< 5	125
5 to 10	100
10 to 20	75
20 to 35	50
> 35	25

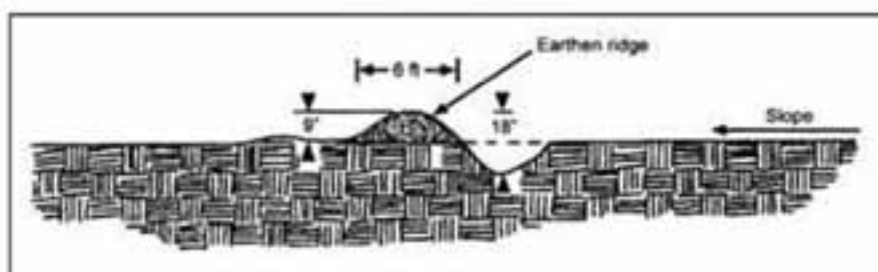


Figure A 15-1 - Side View of Water Bar.

#### ***Proper Installation Method***

- The width of the water bar should be at least 6-feet.
- The water bar should be at least 18-inches high.
- The side slope should be as level as possible along the contour of the hill slope.
- Before the water bar is constructed, the base should be scarified to provide a bond between the existing soil and the fill material.
- The fill used to construct the water bar should be compacted.
- As soon as is practicable, the entire disturbed area should be seeded.

#### ***Common Placement/Installation Mistake to Avoid***

- When practicable, do not install the water bar in a manner that will cause water to flow laterally along the upstream side of the water bar. Water bars should be placed along contours to avoid concentration of flow. When the flow concentrates, it overtops the water bar, which causes the water bar to fail.

#### ***Inspection and Maintenance***

Water bars should be inspected every fourteen days and within 24-hours of a rainfall of 0.5-inches or more. The following questions should be addressed during each inspection:

- **Are there any points along the water bar where water is concentrating?**

When water bars are not placed along contours, water concentrates at low points of the water bar. This concentrated flow usually causes a failure of the water bar. Even if the water bar does not fail, the concentration of flow drastically reduces the overall storage capacity of the water bar. The only solution to this problem is reinstalling the water bar (or sections of it) so that it is level.

- **Have portions of the water bar been eroded by overtopping?**

Overtopping a water bar is caused by portions of the water bar being lower than others, excessive space between water bars, or by extreme runoff events. Water bar installations quickly deteriorate when water overtops them. If a water bar is regularly overtopped, it has probably been placed in a location that receives flows beyond intended capacity. If this is the case, increase the size of the water bar or add additional water bars.

- **Does sediment need to be removed from behind the water bar?**

Sediment accumulated behind the water bar should be removed when it reaches one-half of the original height of the water bar. Allowing too much sediment to accumulate behind a water bar drastically reduces its effectiveness. Because one high-intensity rainfall can dislodge enough sediment from surrounding slopes to completely fill up the space behind the water bar, it is extremely important to inspect water bars within 24-hours of a heavy rainfall.

**Note** – When removing sediment from behind a water bar with a bulldozer or backhoe, take care not to undermine the water bar.

## Appendix 16 – Straw Roll Slope Barriers

### *Purpose and Operation*

Straw roll slope barriers operate by intercepting and ponding sediment-laden runoff. Ponding the water dissipates the energy of the incoming flow and allows much of the suspended sediment to settle. Water exits the straw roll slope barrier by flowing through the straw rolls.

### *Material Specifications*

- Straw rolls are made from straw that is wrapped in tubular mesh netting. They are usually about 8 inches in diameter and 20-25 feet long.
- Biodegradable or photodegradable mesh netting may be preferential in order to reduce the need to remove the straw rolls after revegetation has been completed.
- Wooden stakes should be approximately 3/4 x 3/4 x 24 inches. Willow cuttings or 3/8-inch rebar can also be used for stakes.

### *Placement and Installation*

- It is critical that straw rolls are installed perpendicular to the flow direction and parallel to the slope contour.
- Narrow trenches should be dug across the slope on contour to a depth of 3 to 5 inches on clay soils and soils with gradual slopes. On loose soils, steep slopes, and areas with high rainfall, the trenches should be dug to a depth of 5 to 7 inches, or 1/2 to 2/3 of the thickness of the straw roll.
- Start building trenches and installing straw rolls from the base of the slope and work up. Excavated material should be spread evenly along the uphill slope and compacted using hand tamping or other methods.
- Construct trenches at contour intervals of 3 to 30 feet apart depending on the steepness of the slope, soil type, and rainfall. The steeper the slope the closer together the trenches.
- Install the straw rolls snugly into the trenches and abut tightly end to end. Do not overlap the ends.
- Install stakes at each end of the straw roll, and at 4-foot centers along entire length of straw roll.
- If required, install pilot holes for the stakes using a straight bar to drive holes through the straw roll and into the soil.
- At a minimum, wooden stakes should be approximately 3/4 x 3/4 x 24 inches. Willow cuttings or 3/8-inch rebar can also be used for stakes.
- Stakes should be driven through the middle of the straw roll, leaving 2 to 3 inches of the stake protruding above the straw roll.

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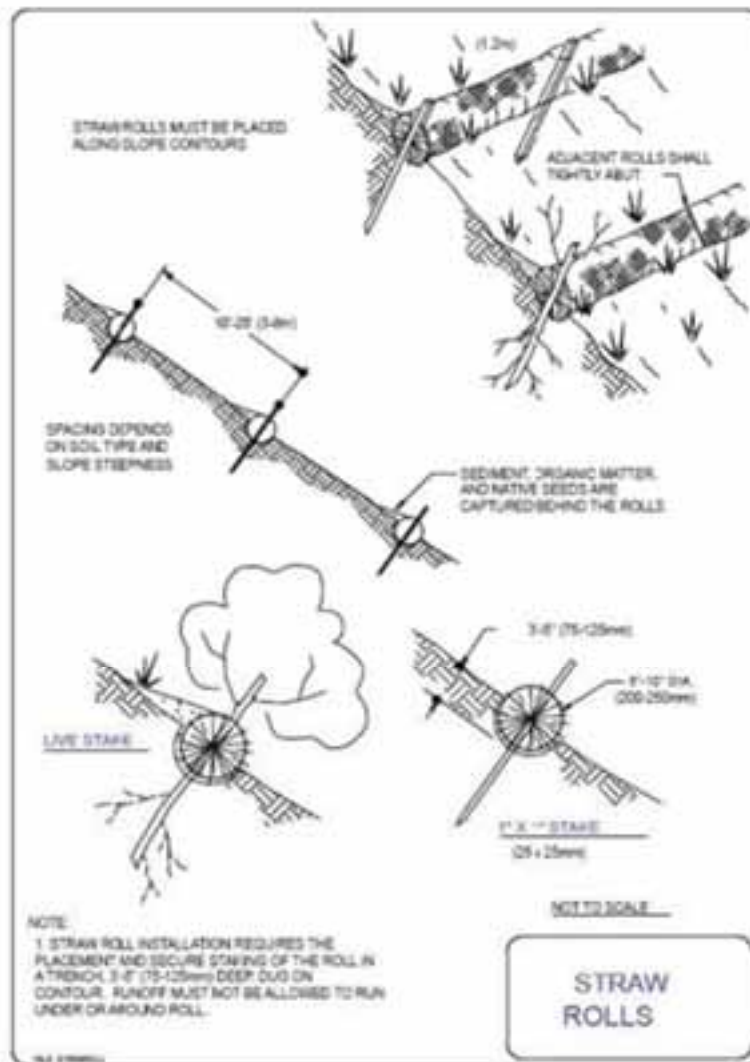


Figure A16-1 Straw Roll Installation

**List of Common Placement/Installation Mistakes to Avoid**

- When practicable, do not place straw roll slope barriers across contours. Slope barriers should be placed along contours to avoid a concentration of flow. Concentrated flow over a slope barrier creates a scour hole on the down-slope side of the barrier. The scour hole eventually undermines the straw roll and the barrier fails.

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A16-2

- Do not place straw roll slope barriers in areas with shallow soils underlain by rock. If the barrier is not anchored sufficiently, it will wash out.

#### ***Inspection and Maintenance***

Straw rolls should be inspected every fourteen days and within 24-hours of a rainfall of 0.5-inches or more. The following items should be addressed during each inspection:

- Straw rolls may require maintenance to ensure they are in contact with soil and thoroughly entrenched, especially after significant rainfall on steep sandy soils.
- Inspect the slope after significant storms and repair any areas where straw rolls are not tightly abutted or water has scoured beneath the straw rolls.
- **Does water flow under the straw roll?**

Water flowing under the straw rolls usually is caused by not trenching the straw rolls deep enough during installation. If the problem is improper trenching, the entire straw roll should be removed and a new one installed using the proper trench depth.

- **Does water flow through spaces between abutting straw rolls?**

Water flowing between straw rolls is usually caused by not butting the straw rolls tightly during initial installation. Ensure that the straw rolls are butted tightly together or overlap at the ends.

- **Are any straw rolls dislodged?**

Under normal conditions, the maximum useful life of a straw roll is one to two seasons (but may be longer during prolonged dry periods). Inspect the straw rolls for signs of decomposition and replace as necessary.

- **Does sediment need to be removed from behind the slope barrier?**

Sediment accumulated behind the slope barrier should be removed when it reaches one-half of the original exposed height of the bales. Allowing too much sediment to accumulate behind a slope barrier drastically reduces its effectiveness. Because one high-intensity rainfall can dislodge enough sediment from surrounding slopes to completely fill up the space behind the slope barrier, it is extremely important to inspect slope barriers within 24-hours of a heavy rainfall.

## Appendix 17 – Surface Roughening

### *Purpose and Operation*

Roughening the soil surface by leaving horizontal depressions or grooves in the soil will serve to intercept and pond sediment-laden water, trap seed, and reduce the velocity of the runoff. Roughening can be accomplished by “track walking” slopes with tracked equipment, by using a serrated wing blade attached to the side of a bulldozer, or by other agricultural equipment. Alternately, roughening can be accomplished by cutting “stair-step cut slopes” across the slope.

### *Design Specifications*

- All slopes need to be seeded immediately after roughening, preferably in conjunction with mulch in order to obtain optimal seed germination and growth.
- Primarily used on slopes of 3:1 or less, but can be used on steeper slopes in conjunction with additional slope control BMP's.
- Height of grousers, or tracks, should be 1½ inches or greater.
- Tracking should be accomplished by driving straight up and down the slope, not across the slope.
- Cut stair step cut slopes when slope is greater than 3:1.
- Use stair-step grading on all erodible material soft enough to be ripped with a bulldozer. Slopes consisting of soft rock with the same subsoil are particularly suited to stair-step grading.
- Make the vertical cut distance less than the horizontal distance, and slightly slope the horizontal position of the step inward toward the vertical wall.
- Do not make individual cuts more than 2 feet high in soft materials, or more than 3 feet in rocky material.

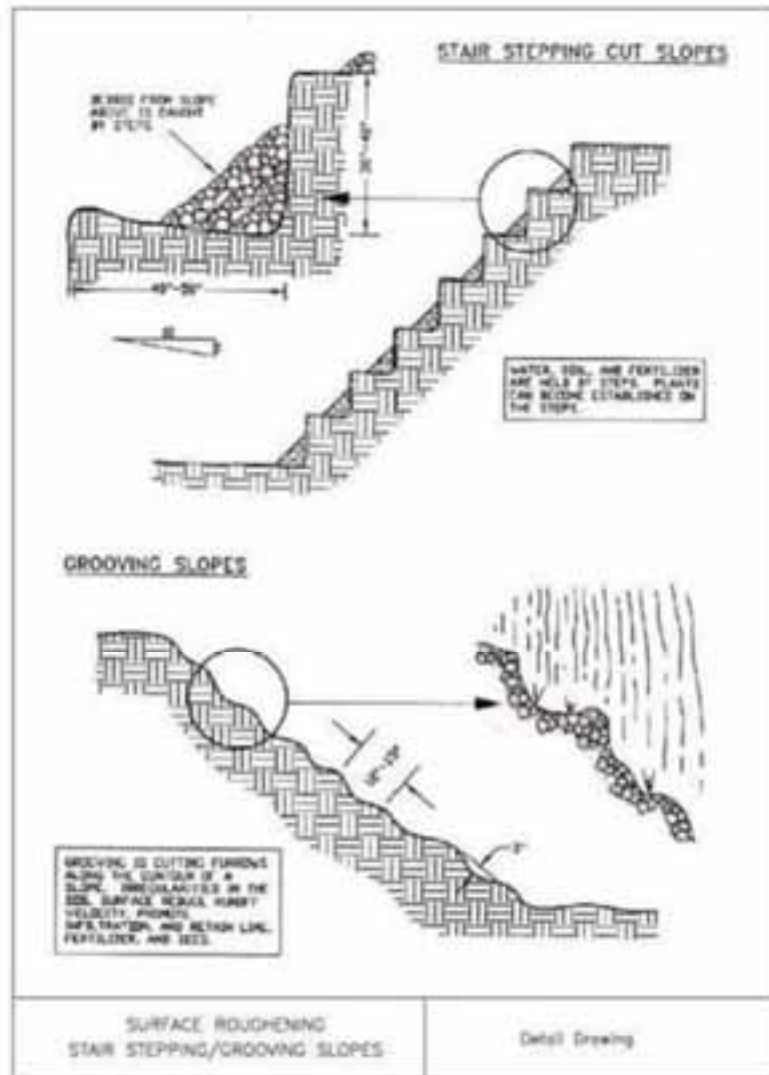


Figure A17-1. Illustration of stair stepping and grooving slopes.

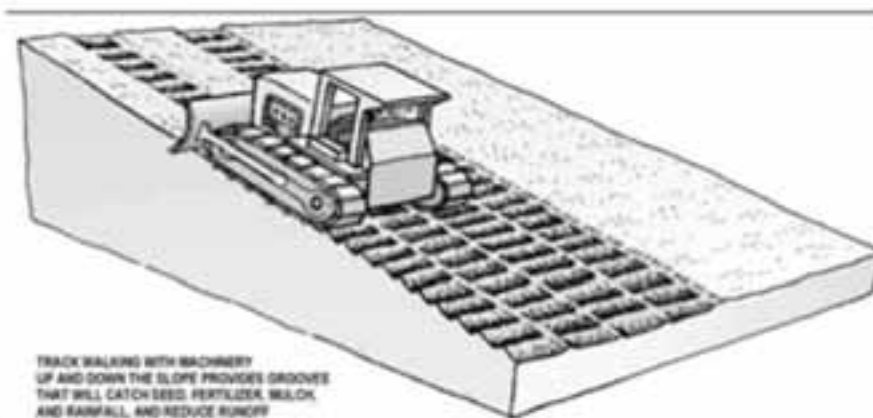


Figure A17-2. Surface roughening with bulldozer.

#### *List of Common Placement/Installation Mistakes to Avoid*

- Do not cross contours when tracking, doing so will provide preferential pathways that accelerate erosion.
- Do not track up and down the slope more than necessary to provide full coverage of tracks. Doing so will compact the soil and make it difficult for seed to germinate.

#### *Inspection and Maintenance*

Areas of slope roughening should be inspected every fourteen days and within 24-hours of a rainfall of 0.5-inches or more. The following questions should be addressed during each inspection:

- **Are there any points along the roughened slope where water is concentrating?**  
If water is concentrating on slope roughened areas, rilling and erosion can occur. If this happens, install other BMP's to control the runoff. Attempting to repair the roughened surface may cause excessive damage to the slope, and should probably not be attempted.
- **Has the roughened slope filled with sediment or washed away?**  
Sediment accumulated in the roughened slope or if the roughening has washed away is probably an indication that additional, alternate BMP's need to be installed.



## Appendix 18 – Maps

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A18-1

## Appendix 19 – Inspection Forms

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A19-1

## Inspection and Maintenance Form Newfield, Oil and Gas SWPPP

Project Name: \_\_\_\_\_

Date of inspection: \_\_\_\_\_

Inspector: \_\_\_\_\_

This inspection is a:

- ☐ 14-day inspection (active const.)
- ☐ Monthly inspection (site inactive)
- ☐ Rain event inspection (must inspect w/in 24-hours of event)

### Best Management Practices (BMPs)

Silt fence, straw roll, and rock check dams:

- ☐ Silt fence, straw roll, and rock check dams are in good condition.
- ☐ Silt fence, straw roll, and rock check dams need the following repairs, maintenance, changes (note needed activity and location):

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Storm water diversion trenches and ditch relief culverts:

- ☐ Diversion trenches and ditch relief culverts are in good condition.
- ☐ Diversion trenches and ditch relief culverts need the following repairs, maintenance, changes (note needed activity and location):

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Slope barriers:

- ☐ Slope barriers are in good condition.
- ☐ Slope barriers need the following repairs, maintenance, changes (note needed activity and location):

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Mulched areas:

- ☐ Mulched areas are in good condition.
- ☐ Mulched areas need the following repairs, maintenance, changes (note needed activity and location):

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Water bars:

- ☐ Water bars are in good condition.
- ☐ Water bars need the following repairs, maintenance, changes (note needed activity and location):

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Low Water Crossings:

- ☐ Low water crossings are in good condition.
- ☐ Low water crossings need the following repairs, maintenance, changes (note needed activity and location):

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Diversion Dips:

- ☐ Diversion dips are in good condition.
- ☐ Diversion dips need the following repairs, maintenance, changes (note needed activity and location):

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Trash is being contained and hauled off site? ☐ Yes ☐ No

Fuel storage area is in conformance with site SPCC? ☐ Yes ☐ No

Note any deficiencies and repairs needed for these BMPs.

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Briefly describe any repairs or changes to the SWPPP implemented as a result of this inspection.

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- ☐ Check here if the facility *is in compliance* with the site SWPPP and the large construction general storm water permit.

**Certification:** I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

\_\_\_\_\_  
Printed Name of Person Signing

\_\_\_\_\_  
Title

\_\_\_\_\_  
Signature of Applicant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Telephone

\_\_\_\_\_  
Newfield Production Company  
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# **Appendix G**

## **Newfield's Regional Spill Prevention, Control, and Countermeasure (SPCC) Plan**



# **SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN**

**North Dakota**

**August 2010**

**Prepared for:**

**Newfield Exploration Co.**

**Prepared by:**



**300 E. Mineral Ave., Suite 10**

**Littleton, Colorado 80122**

**(303) 781-8211**

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## REGULATORY CROSS-REFERENCE

Regulatory Citation	Description of Regulatory Requirement	Section Number
§112.3 (d)(3)	Professional Engineer Certification	1.5, Appendix E
§112.3	Applicable Industry Standards	2.4
§112.5 (a),(c)	Plan Amendments and Certification	1.7, 1.7.2, 1.7.3, Appendix E
§112.5(b)	Plan Review	1.7, 1.7.1
§112.7	General Requirements - Management Approval	1.3
§112.7	General Requirements - Sequence or Cross-Reference	Cross-Reference
§112.7	General Requirements - Discussion of Facilities Not Yet Fully Operational	1.4
§112.7(a)(2)	Deviation from Requirements: Reasons, Methods, and Equivalent Protection	2.1, Appendix F
§112.7(a)(3)	Physical Layout and Facility Diagram	2.2, Appendix F
§112.7(a)(3)(i)	Container Capacity and Type of Oil	Appendix F
§112.7(a)(3)(ii)	Discharge Prevention Measures	2.6
§112.7(a)(3)(iii)	Discharge or Drainage Controls	2.6
§112.7(a)(3)(iv)	Countermeasures: Discovery, Response, and Cleanup	2.9
§112.7(a)(3)(v)	Disposal: Legal Requirements	2.9
§112.7(a)(3)(vi)	Notification Phone Lists	2.5, Appendix A
§112.7(a)(4)	Discharge Notification Form	2.5, Appendix A
§112.7(a)(5)	Discharge Procedures Organized	2.5, Appendix A
§112.7(b)	Fault Analysis	2.6
§112.7(c)	Adequate Secondary Containment	2.1, 2.6, Appendix F
§112.7(d)(1)	Contingency Planning	2.8
§112.7(d)(2)	Commitment of Resources	2.8
§112.7(e)	Inspections, Tests, and Records - Written Procedures	3.1.1, 3.1.2
§112.7(e)	Inspections, Tests, and Records - Records of Inspections & Tests; Signatures	Appendix B
§112.7(e)	Inspections, Tests, and Records - Records Maintenance	Appendix B
§112.7(f)(1)	Personnel Training	3.2
§112.7(f)(2)	Designated Person Accountable for Spill Prevention	1.2, 3.2
§112.7(f)(3)	Spill Prevention Briefings	3.2
§112.7(g)(1)	Security	2.11
§112.7(g)(2)	Flow and Drain Valves Secured	2.11
§112.7(g)(3)	Pump Controls Locked Off; Facility Access Secured	2.11
§112.7(g)(4)	Loading/Unloading Connections Sealed	2.11
§112.7(g)(5)	Lighting Appropriate for Facility	2.11
§112.7(h)	Tank Truck Loading/Unloading Area	2.6
§112.7(i)	Brittle Fracture Evaluation	3.1.3
§112.7(j)	Conformance with State Requirements	2.10
§112.8	SPCC Plan Requirements: Onshore Facilities Excluding Production Facilities	2.11
§112.9(b)	Oil production facility drainage	3.1, Appendix C
§112.9(c)	Oil production facility bulk storage containers	3.1, Appendix F
§112.9(d)	Facility transfer operations, oil production facility	3.1, Appendix C
§112.10(b)	Mobile facilities	4.0
§112.10(c)	Secondary containment - catchment basins or diversion structures	4.0
§112.10(d)	Blowout prevention (BOP)	4.0
§112.11	Plan Requirements for offshore oil drilling, production, or workover Facilities	2.11
§112.12	SPCC plan requirements for onshore facilities (excluding production)	2.11
§112.13	SPCC plan requirements for onshore oil production facilities	2.11
§112.14	SPCC plan requirements for onshore oil drilling facilities	2.11
§112.15	SPCC plan requirements for offshore oil drilling facilities	2.11
§112.20	Facility Response Plans / Certification of Applicability of Substantial Harm Criteria	2.11, Appendix F

## **1.0 GENERAL INFORMATION**

### **1.1 Facility and Operator General Information**

1. Name of Facility: **North Dakota**
2. Type of Facility: **Onshore Production Facility**
3. Facility Location: **A list of the individual facilities subject to this plan is located in Appendix F.**
4. Name and Address of Owner or Operator

Name: Newfield Exploration Co.

Address: 1401 17<sup>th</sup> Street, Suite 1000  
Denver, CO 80202

### **1.2 Designated Person Accountable for Oil Spill Prevention (40 CFR 112.7 (f) (2))**

The following person reports to management and is accountable for discharge prevention at the subject facilities.

Name: Jeff Odom  
Title: Supervisor

### **1.3 Management Approval (40 CFR 112.7)**

Newfield Exploration Co. is committed to the prevention of discharges of oil to the environment, including navigable waters, and maintains the highest standards for spill prevention control through regular review, updating and implementation of this SPCC plan. With the signature below, I certify that this Spill Prevention, Control and Countermeasures plan will be implemented as herein described.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Name: Watty Strickland

Title: Operations Manager – RM East Team

#### 1.4 Plan Implementation (40 CFR 112.7)

Any additional facilities, procedures, methods, or equipment not yet fully operational are discussed below with the details of installation and start-up.

Inspection and testing procedures specified in Section 3.0 are to be implemented as soon as practical, but no later than six months following the date of this plan.

Secondary containment structures for containers and process equipment are to be constructed and maintained as indicated on the facility diagram in accordance with API Standard 2610 - *Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities*. The containment structures are to be constructed or improved as soon as practical, but no later than six months following the date of this plan.

#### 1.5 Professional Engineer Certification (40 CFR 112.3 (d))

By means of this Professional Engineer Certification, I hereby attest that:

- 1) I am familiar with the provisions of 40 CFR Part 112;
- 2) I, or my agent, have visited and examined the facilities (facility specific certification is included in Appendix F);
- 3) This SPCC Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards, and with the requirements of 40 CFR 112;
- 4) Procedures for required inspections and testing have been established, and
- 5) This plan is adequate for the subject facilities (facility specific certification is included in Appendix F).

Douglas N. Henderer

Printed Name of Registered Professional Engineer

Registration No.: 35230 State: CO

## 1.6 Plan History

This plan supersedes all plans listed in the following table:

Plan Name	Date Created
1. North Dakota	January 2008
2.	
3.	
4.	
5.	
6.	
7.	
8.	

## 1.7 Plan Review and Amendments (40 CFR 112.5)

### 1.7.1 Review Summary

In accordance with 40 CFR 112.5(b), a review and evaluation of this SPCC plan is conducted at least once every five years. As a result of this review and evaluation, Newfield Exploration Co. will amend the plan to include more effective spill prevention and control technology if:

- 1) Such technology will significantly reduce the likelihood of a spill event from the facilities, and
- 2) If such technology has been field-proven at the time of the review.

Original Date of Plan: **August 5, 2010**

By my signature below, I attest that I have completed a review and evaluation of this SPCC plan for the North Dakota.

Review Date	Signature	Printed Name	Title	Plan Amended (Yes/No)
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### 1.7.2 SPCC Plan Amendments

In accordance with 40 CFR 112.5(a), this SPCC plan will be amended within six months if modifications to the facility materially affect the potential for discharges of oil into or upon navigable waters. Technical amendments to this SPCC plan shall be certified by a Registered Professional Engineer. Modifications which may require plan amendments and certification include, but are not limited to:

- 1) Commissioning or decommissioning of containers;
- 2) Replacement, reconstruction, or movement of containers;
- 3) Reconstruction, replacement or installation of piping systems;
- 4) Construction or demolition actions that may alter secondary containment structures;
- 5) Changes in products or type of equipment service; or
- 6) Changes in operating and maintenance procedures.

Such amendments shall be implemented as soon as possible, but no later than six months after such changes occur.

Administrative or non-technical amendments do not require the certification of a Registered Professional Engineer. Examples of administrative changes include, but are not limited to, phone number changes, contact name changes, facility name changes or any non-technical text revisions.

Technical and administrative amendments to this plan are tracked on the Amendment Summary in Appendix E. Detailed descriptions and certification pages, if necessary, for each amendment follow the Amendment Summary in Appendix E.



## **2.0 SPILL PREVENTION AND CONTROL**

### **2.1 Facility Conformance (40 CFR 112.7(a)(1) and (2))**

The subject facilities are in conformance with 40 CFR 112 as amended on November 5, 2009 with exceptions noted in the table below. The reason for any nonconformance and the provided equivalent environmental protection measures are also noted. Deviations listed in this table may be present at one or more facility subject to this plan. Deviations from the requirements of 40 CFR 112 are further detailed in the site specific section in Appendix F.

<b>Conformance Deviation</b>	<b>Reason for Nonconformance</b>	<b>Equivalent Environmental Protection Measures</b>
Separation equipment are not provided with a means of secondary containment as specified by 112.9(c)(2).	Secondary containment for separation equipment is not practicable as dikes or trenches can trap explosive and toxic gases creating a safety hazard and would also interfere with access required for normal operations.	The operator has implemented an oil spill contingency plan and a written commitment of manpower. The facility is visited on a frequent basis and any spills or accidental releases of oil are promptly cleaned up by the operator.

### **2.2 Facility Physical Layout (40 CFR 112.7 (a)(3))**

The subject properties are typical onshore crude oil and/or natural gas production facilities consisting of wellheads, separation equipment and bulk storage containers.

A diagram of each subject facility is located in Appendix F. The following details and location information, as applicable, is included on the diagram:

- 1) Containers and their contents;
- 2) Completely buried and/or bunkered tanks including underground storage tanks subject to 40 CFR Part 280 or 281; and
- 3) Drum and portable container storage areas.

### **2.3 Drainage Pathways and Distances to Navigable Waters**

Drainage pathways proximate to the subject facilities and USGS topographic maps for the area are contained in Appendix F.

## 2.4 Applicable Industry Standards (40 CFR 112.3)

The design, construction, operation and maintenance of the subject facilities are to be conducted in conformance with the following industrial standards as applicable.

Facility Component	Applicable Industry Standards
Secondary Containment	<b>API Standard 2610</b> - Design, Construction, Operation, Maintenance and Inspection of Terminal and Tank Facilities. <b>API Recommended Practice 51</b> - Onshore Oil and Gas Production Practices for Protection of the Environment. <b>NFPA 30</b> - Flammable and Combustible Liquids Code <b>BOCA</b> - National Fire Prevention Code
Loading and Unloading Areas	<b>API Standard 2610</b> - Design, Construction, Operation, Maintenance and Inspection of Terminal and Tank Facilities. <b>NFPA 30</b> - Flammable and Combustible Liquids Code
Diked Area Drainage	<b>API Standard 2610</b> - Design, Construction, Operation, Maintenance and Inspection of Terminal and Tank Facilities. <b>API Recommended Practice 51</b> - Onshore Oil and Gas Production Practices for Protection of the Environment. <b>NFPA 30</b> - Flammable and Combustible Liquids Code
Storage Tank Construction and Materials	<b>API Standard 620</b> - Design and Construction of Large Welded Low Pressure Storage Tanks. <b>API Standard 650</b> - Welded Steel Tanks for Oil Storage. <b>STI F911</b> - Standard for Diked Aboveground Steel Tanks <b>STI Publication R931</b> - Double Wall Aboveground Storage Tank Installation and Testing Instructions. <b>UL Standard 142</b> - Steel Aboveground Tanks for Flammable and Combustible Liquids. <b>UL Standard 1316</b> - Standard for Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products. <b>PEI Recommended Practice 200</b> - Recommended Practices for Installation of Aboveground Storage Systems for Motor Vehicle Fueling
Facility Equipment	<b>API Specification 12 B</b> - Bolted Tanks for Storage of Production Liquids <b>API Specification 12 D</b> - Field Welded Tanks for Storage of Production Liquids <b>API Specification 12 F</b> - Shop Welded Tanks for Storage of Production Liquids <b>API Specification 12 J</b> - Oil Gas Separators <b>API Specification 12 K</b> - Indirect-Type Oil Field Heaters <b>API Specification 12 L</b> - Vertical and Horizontal Emulsion Treaters
Corrosion Protection for Buried Piping	<b>NACE Recommended Practice 0169</b> - Control of External Corrosion on Underground or Submerged Metallic Piping Systems. <b>STI Recommended Practice 892</b> - Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems.
Inspection Procedures	<b>API Recommended Practice 12R1</b> - Recommended Practice for Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Productions Service. <b>API Recommended Practice 510</b> - Alternative Rules for Exploration and Production Pressure Vessels. <b>API Standard 574</b> - Inspection Practices for Piping Systems.

Facility Component	Applicable Industry Standards
	<b>API Standard 653</b> - Tank Inspection, Repair, Alteration, and Reconstruction.
Inspection and Testing of Piping and Valves	<b>API Standard 570</b> - Piping Inspection Code. <b>API Recommended Practice 574</b> - Inspection Practices for Piping System Components. <b>ASME B31.3</b> - Process Piping <b>ASME 31.4</b> - Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols.
Secondary Containment for Drilling and Workover Operations	<b>API Recommended Practice 52</b> - Land Drilling Practices for Protection of the Environment. <b>NFPA 30</b> - Flammable and Combustible Liquids Code <b>BOCA</b> - National Fire Prevention Code
Integrity Testing	<b>API Standard 653</b> - Tank Inspection, Repair, Alteration, and Reconstruction. <b>API Recommended Practice 575</b> - Inspection of Atmospheric and Low-Pressure Tanks. <b>API Standard 570</b> - Piping Inspection Code <b>ASME B31.3</b> - Process Piping <b>ASME 31.4</b> - Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols. <b>STI Standard SP001-00</b> - Standard for Inspection of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids <b>UL Standard 142</b> - Steel Aboveground Tanks for Flammable and Combustible Liquids.
Brittle Fracture Evaluation	<b>API Standard 653</b> - Tank Inspection, Repair, Alteration, and Reconstruction. <b>API Recommended Practice 920</b> - Prevention of Brittle Fracture of Pressure Vessels.

Note: API - American Petroleum Institute  
ASME - American Society of Mechanical Engineers  
BOCA - Building Officials and Code Administrators International  
NACE - National Association of Corrosion Engineers  
NFPA - National Fire Protection Association  
PEI - Petroleum Equipment Institute  
STI - Steel Tank Institute  
UL - Underwriters Laboratories

## 2.5 Spill Response and Contact List and Phone Numbers (112.7 (a)(3-5))

The following steps could be taken to reduce the magnitude of the spill and initiate containment and cleanup:

1. Account for personnel and assure the safety of personnel. In the case of fire, explosion, or exposure hazards, evacuate all personnel.
2. Remove all sources of ignition.
3. Position fire suppression equipment, if necessary.
4. Alert the local fire department, if necessary.

5. Shut of pumps and close valves that allow oil to flow to the segment of the system from where the spill is occurring.
6. Repair, plug, or patch the leaking equipment if possible.
7. Alert adjacent property owners/operators, as necessary.
8. If conditions have been deemed safe, attempt to contain the spill. Prevent or divert spilled oil from approaching structures, in particular, water or storm drains. Sorbent material, spark-proof shovels, brooms, neoprene gloves, and other spill response materials may be obtained and utilized as necessary.
9. Contact Newfield Exploration Co. operation personnel (Appendix A) to provide details of the situation and to receive further instruction regarding additional and cleanup actions, as needed.

Lists of contact names and phone numbers for Newfield Exploration Co. personnel, company approved cleanup contractors, and federal and state agencies are contained in Appendix A. Also included in Appendix A are forms to be used for organizing release notification information and the submission of required information to the EPA Regional Administrator for qualified discharges.

A qualified discharge is any oil spill that contacts surface water, whether flowing or not, or an intermittent drainage and results in a “visible sheen” on the water.

## **2.6 Spill Prediction and Control (40 CFR 112.7 (a) and (b))**

Equipment located at the subject facilities with the potential to accidentally release oil are specifically addressed by location in Appendix F.

The reasonably expected modes of major failure or accident for which oil could be released from the facilities are as follows:

### **A. Bulk Storage Tank Leak or Failure**

- I. Failure Modes: Corrosion, vandalism, lightning strikes, valve or piping failure, overfilling.
- II. Rate of Flow: Variable, depending upon the type, size and location of the tank failure. The ambient temperature at the time of the release may affect the viscosity of the oil and thereby impact the rate of flow. Flow rates for corrosion failure are typically low, ranging from less than a gallon per day to a gallon per hour. Flows resulting from valve and piping failures or vandalism typically range from a gallon per hour to 400 bbls per hour. Lightning strikes may result in a release that is essentially instantaneous.

- III. Discharge Quantity: Variable depending upon the type and location of the failure. The total quantity discharged would not exceed the working capacity of the largest tank.
- IV. Preventative Measures: Personnel routinely perform visual inspections of storage tanks. Storage tanks are constructed in accordance with API industry standards. Materials used in constructing the tanks are compatible with the substances stored. Where practicable, earthen berms or other diversionary structures are utilized to control any released fluids. Tanks are appropriately sized to minimize the risk of overfilling.

#### B. Tanker Truck Loading and Unloading Operations

- I. Failure Modes: Piping or valve failure, tank failure, overflow, and human error.
- II. Rate of Flow: Variable depending upon the type, size and exact location of the failure, and the amount of oil in the tanker truck and storage tank. The ambient temperature at the time of the release may affect the viscosity of the oil and thereby impact the rate of flow. Flow rates resulting from piping and valve failures can range from 1 gallon per hour up to 400 bbls per hour. The flow rate for tank truck overflows typically will not exceed 5 to 10 bbls per minute. Tank failures may result in releases that are essentially instantaneous.
- III. Discharge Quantity: Variable depending upon the type and location of the failure. The total quantity discharged would not exceed the working capacity of the largest tank.
- IV. Preventative Measures: Tanker truck loading and unloading operations are conducted in accordance with United States Department of Transportation regulations (49 CFR 177). All loading operations are attended by the truck driver. No smoking or open flames are allowed in the vicinity of the storage tanks and loading area. Wheel chocks are placed at the wheel nearest the truck loading connection to reduce the risk of the truck movement during loading operations. Following the completion of loading operations, the transfer line is disconnected and all valves and outlets on the tanker truck and the storage tank are visually inspected for leakage prior to vehicle departure.

In addition, for truck loading where the loading occurs outside of containment, absorbents are readily available for use in the case of a release.

#### C. Process Unit Failure (Separator/Heater Treater/Gun Barrel)

- I. Failure Modes: Process vessels may potentially rupture, or associated lines, valves and gauges may fail or leak.
- II. Rate of Flow: Variable, depending upon the mode and extent of the failure. The maximum expected rate of flow from a process unit failure is the oil process rate of the equipment plus any additional fluid volume contained in the vessel above the elevation of the rupture. The oil process rates for the subject equipment are contained in Appendix F.
- III. Discharge Quantity: Variable, depending on the type of failure and the length of time that the failure went undetected.
- VI. Preventative Measures: Personnel routinely perform visual inspections of process units. Process units are constructed in accordance with API and ASME industry standards. Where practicable, earthen berms or other diversionary structures are utilized to control any released fluids.

#### D. Piping Failure

- I. Failure Modes: Both aboveground and buried pipelines may rupture or corrode and leak. Associated flanges, screwed connections, valves and gauges are also subject to corrosion and may fail or leak.
- II. Rate of Flow: Variable, depending on the size and location of the piping related failure. The maximum potential rate of flow is not expected to exceed the oil process rates as listed in Appendix F.
- III. Discharge Quantity: Variable depending upon the type and extent of the failure and the length of time that the failure went undetected.
- IV. Prevention Measures: Personnel routinely perform visual inspections of aboveground piping and buried flowline right-of-ways to detect failures. As warranted by soil conditions, corrosion protection is provided for buried pipelines.

## 2.7 Impracticable Containment or Diversion Measures (40 CFR 112.7 (d))

In some instances, containment, diversionary structures, or equipment to prevent oil from reaching navigable waters may not be practicable. Secondary containment is provided for equipment located at the subject facilities as indicated in Appendix F.



Secondary containment or diversionary structures may be impracticable for some equipment at these facilities for the following reasons:

Extensive diking and/or drainage trenches would interfere with site access for normal operations and also with current surface land use.

An effective dike system would be difficult to design and to construct. Damage to vegetation and potential erosion due to construction of dikes would probably be worse than the risk adjusted environmental impact of a spill. It would also be difficult to maintain dike integrity and to drain off rain water.

Flowlines operate at pressures far below the rated working pressure and therefore have a minimal risk of rupture.

Berms, trenches and other means of containment can trap explosive gases such as methane and hazardous vapors such as hydrogen sulfide leading to potential safety and exposure problems.

The berms or diversions would trap storm water and cause muddy conditions which in turn can create slippery unsafe working conditions. Trapped water may also increase the rate of corrosion.

Other: \_\_\_\_\_

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## **2.8 Oil Spill Contingency Plan and Commitment of Manpower (40CFR112.7 (d)(1) & (2))**

Newfield Exploration Co. maintains a strong contingency plan for oil spills and a written commitment of manpower follows.

Newfield Exploration Co. is committed to a strong antipollution and spill prevention program. We are committed to designing and operating our facilities in a manner that will minimize the size and occurrence of spills. We are committed to a strong, pro-active training and inspection program that will insure that our facilities are operated and maintained in a manner that will prevent or minimize the occurrence of spills.

In the event of a spill, Newfield Exploration Co. will commit the manpower, equipment and materials necessary to ensure that the cleanup occurs in the shortest practical time while minimizing environmental damage and maximizing product recovery.

## **2.9 Discharge Countermeasures and Methods of Disposal (40 CFR 112.7 (a)(3)(iv)&(v))**

In the event of an accidental release, Newfield Exploration, Co. personnel will promptly initiate recovery actions as appropriate.

### **Levels of Response**

Major Releases: Major releases are defined as:

1) Spills of crude oil, condensate, or saltwater greater than 10 bbls, or 2) Spills of refined crude oil products, including but not limited to, gasoline, diesel fuel, aviation fuel, asphalt, road oil, kerosene, fuel oil, and derivative of mineral, animal or vegetable oils, or 3) Any volume of oil which results in a fire, will reach a water course, or may with reasonable probability endanger public health or result in substantial damage to property or the environment.

Major releases will be handled under the direction of Newfield Exploration Co. personnel. Response contractors listed in Appendix A will be utilized as necessary to complete the cleanup. If oil should threaten surface waters, the company contingency plan will be implemented. Containment structures would be constructed and booms would be deployed as needed to protect waterways.

Minor Releases: Releases not classified as major shall be reported internally to the appropriate supervisor on an incident report.

### **Product Recovery and Handling**

#### **Spills onto Soil**

Mobile oil spills should be contained as soon as possible by the construction of earthen dams or by the placement of mechanical barriers. Free oil may be removed from the ground by the use of a vacuum truck. Sumps or trenches may be dug to intercept or drain free oil. Remaining free oil may be removed from the ground by the use of oil-absorbent materials.

When all free oil has been removed, the affected soil containing over 1.0% total petroleum hydrocarbon (TPH) by weight should be delineated, both vertically and horizontally. All soil

containing over 1.0% TPH should then be excavated by backhoe or similar appropriate equipment for remediation or disposal.

To prevent storm water contamination, all impacted soils containing in excess of 1.0% TPH should be placed in an approved disposal site or in a secure interim storage location for future remediation or disposal, unless more immediate on-site techniques can be implemented. Placing the impacted soil on a sheet of visquene and providing appropriate cover, diking, or stormwater diversions, is acceptable.

A final cleanup level of 1.0% TPH should be achieved as soon as practicable. Several methods are acceptable for the cleanup of oil contaminated soil; regulatory agencies may specify which methods are appropriate.

### **Spills onto Water**

Oil spills onto surface waters must be cleaned up to the satisfaction of the landowners and regulatory agencies. The spill should be contained as soon as possible by the use of floating booms or other mechanical barriers. Free oil may be removed from the water by the use of a vacuum truck or by oil-skimming equipment. Remaining free oil may be removed from the water by the use of oil-absorbent materials such as spray-sorb. Oil-absorbent materials may also be used to remove oil that has accumulated on shoreline soils, rocks and vegetation. Oil contaminated shoreline materials may require removal to a suitable treatment site for cleanup as described above.

## **2.10 Regulatory Conformance**

The subject properties are not subject to any state regulated discharge prevention and containment requirements beyond those specified by federal regulation.

## **2.11 Regulatory Exclusions**

The subject properties are classified as onshore production facilities which store only petroleum based oils. Furthermore, the properties are not expected to cause substantial harm to the environment as demonstrated by the completed Certification of Substantial Harm Determination form contained with facility site specific information in Appendix F. As such, the subject properties are excluded from the following regulations:

### **Subpart A – General Requirements**

40 CFR 112.7(g) Security

### **Subpart B - Requirements for Petroleum Oils and Non-Petroleum Oils except Animal Fats**

- 40 CFR 112.8 SPCC plan requirements for onshore facilities (excluding production)
- 40 CFR 112.11 SPCC plan requirements for offshore oil facilities

**Subpart C - Requirements for Animal Fats and Oils, Greases, Fish and Marine Oils**

- 40 CFR 112.12 SPCC plan requirements for onshore facilities (excluding production)
- 40 CFR 112.13 SPCC plan requirements for onshore oil production facilities
- 40 CFR 112.14 SPCC plan requirements for onshore oil drilling facilities
- 40 CFR 112.15 SPCC plan requirements for offshore oil drilling facilities

**Subpart D - Response Requirements**

- 40 CFR 112.20 Facility response plans
- 40 CFR 112.21 Facility response training and drills/exercises

### **3.0 INSPECTIONS, TESTING AND TRAINING**

#### **3.1 Inspections and Testing (40 CFR 112.7 (e))**

Written procedures are outlined in Section 3.1.1 and utilized when performing prescribed inspection and testing of equipment. Records of inspections and tests are to be signed by the appropriate supervisor/inspector and maintained at the local office.

The following items are inspected to minimize oil discharges from occurring; tanks for leaks and corrosion, process units for leaks and corrosion, sight glasses for leaks, pumps for leakage around packing glands, lines for leaks around fittings, flowlines for leaks, wellheads and metering stations for leakage. If problems are identified, prompt action is taken for repairs. A record of inspection is to be kept with the SPCC Plan for at least 3 years. A copy of the inspection form is included in Appendix B.

##### **3.1.1 Scheduled Examinations**

The lease operator, in the course of their normal routine, is responsible for examining the facilities covered by this SPCC Plan. This periodical review is to insure that the facilities are operating properly and that no problems exist. In addition to periodical observations made by lease personnel in their routine activities, a formal documented inspection of the facilities will be conducted on an annual basis to insure that the facilities are in compliance with the SPCC Plan. Following are general procedures for conducting the formal examinations. There may be specific items covered in the SPCC Plan that are specific to a facility and may not be covered by these general guidelines. Conversely, certain items covered by these procedures may not apply to every facility.

The Production Facility SPCC Examination Form contained in Appendix B is to be used to document the periodic examinations. The examinations are to be conducted and documented on an annual basis at a minimum.

**THE FOLLOWING ITEMS (if present) MUST BE INSPECTED:**

##### **Ditches and Waterways**

Drainage ditches in and around the facility and within the field, roadside ditches, water courses, ponds, etc. will be inspected for oil accumulations and/or evidence of saltwater spills.

##### **Above Ground Piping**

Flowlines, injection lines, gathering lines, gas lift lines, and other piping in and around batteries, separation facilities, saltwater handling facilities, etc. will be inspected for leaks, evidence of leaks, and evidence of potential leaks. Lines along roads will be inspected while driving through the field. Other above ground lines will be walked periodically.

**Tanks**

All liquid storage tanks, except fresh water tanks, (including crude oil, saltwater, fuel, treatment chemicals containing oils, lube oil, etc.) and associated piping will be visually inspected for leaks, overflows, and signs of potential problems. Special emphasis will be placed on the inspection of foundations, bottom seams, patches, flanges, piping connections, sight-glasses, and other openings. Valves should be in their proper position and locked or sealed, if required.

**Berms**

Earthen berms will be inspected for adequate capacity, erosion and leaks. Steel berms will be inspected for damage and leaks. Cement firewalls will be inspected for leaks, cracks, or other signs of failure. If present, liners will be inspected for damage and leaks. All recorded damage will be repaired.

All berms or firewalls will be inspected for accumulations of liquid. Accumulations of liquid will be removed. If the liquid is from one of the tanks, the source will be found and repaired. Rainwater will be removed as soon as feasible after rain (see below).

If a firewall or berm is equipped with a drain, the drain **MUST** be closed, sealed and locked when not in use. The drain must be manned whenever it is in use. Each drainage event must be recorded. The Drainage Log contained in Appendix C will be used for this record.

**Line Heaters, Separators, Heater Treaters and Glycol Units**

These pieces of equipment should be visually inspected for leaks, especially around valves, fittings, inspection plates and sight glasses. Vents on glycol units should be inspected for excessive liquid carryover. Glycol still vents must discharge into an appropriate container if liquids are generated.

**Chemical Storage Tanks, Pumps and Piping**

Chemical injection systems should be inspected for leaks, especially around storage tanks, pumps and fittings on tubing or piping.

**Lube Oil Systems**

Lube oil storage tanks and the piping systems should be inspected, especially around tanks, pumps and fittings on the piping or tubing.

**Flare System**

Any liquid handling system associated with a flare system, liquid knock-outs, etc., should be inspected.

The flare ignition system should be checked periodically. Any evidence of liquid carryover should be reported and corrective action to prevent reoccurrence implemented. If liquid carryovers are frequent, containment should be constructed to contain the carryover.



### **Drain Pans or Drip Pans**

The liquid level in drip or drain pans should be checked and emptied as necessary.

### **Pressure Relief Valves**

Pressure relief valves should be checked for leaks, evidence of leaks and signs of failure.

### **Plant Process Heaters**

Plant process heaters should be checked for leaks, evidence of leaks and signs of failure. The stack should be checked for visible smoke emissions.

### **Alarm Systems**

All alarm and shut down systems should be tested periodically for proper function.

### **Rainwater Removed from Berms**

All discharges of rainwater from berms to drainage **MUST BE RECORDED**. The date of discharge must be noted on the Drainage Log contained in Appendix C.

Prior to discharge, the water must be visually inspected for the presence of oil and tested for the presence of saltwater. If either is present, the water cannot be discharged and must be disposed of in a permitted disposal system or other acceptable manner.

## **3.1.2 Inspections**

Comprehensive inspections of oil containing equipment may be performed as opportunities allow or when indicated during the completion of a scheduled examination. These inspections should be conducted by a competent person or a qualified inspector in accordance with the standards listed below. The inspections are to be documented using the checklists contained in Appendix B and the records maintained at the appropriate field office. If problems are identified, appropriate corrective actions are to be implemented and noted on the inspection form.

<b>Equipment</b>	<b>Inspection Standard</b>
Bulk Storage Tanks	<b>API RP 12R1</b> - Recommended Practice for Setting, Maintenance, Inspection, Operation, and Repair of Tanks In Production Service
Pressure/Process Vessels	<b>API RP 510</b> - Alternative Rules for Exploration and Production Pressure Vessels
Piping	<b>API 574</b> - Inspection Practices for Piping System Components

## **3.1.3 Integrity Testing Procedures (40 CFR 112.7 (d))**

When conditions make it impracticable to provide secondary containment, periodic integrity testing will be conducted for affected storage containers and separation equipment. The following industrial standards for conducting integrity tests will be utilized as appropriate.

<b>Industrial Testing Standard</b>	<b>Title</b>
API Standard 653	Tank Inspection, Repair, Alteration, and Reconstruction
API Recommended Practice 575	Inspection of Atmospheric and Low-Pressure Tanks
API RP 510	Production Pressure Vessels
ASME 31.4	Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols
Steel Tank Institute Standard SP001-00	Standard for Inspection of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids
UL Standard 142	Steel Aboveground Tanks for Flammable and Combustible Liquids

#### **3.1.4 Brittle Fracture Evaluation (40 CFR 112.7(i))**

All field constructed aboveground tanks and process equipment are to be evaluated for the risk of failure due to brittle fracture whenever:

- 1) The equipment undergoes repair, alteration, reconstruction, or a change in service that may affect the risk of a discharge or failure due to brittle fracture, or
- 2) The equipment has discharged oil or failed due to brittle fracture failure or other catastrophe.

The brittle fracture risk evaluation is to be conducted in accordance with the following industrial standards as appropriate.

- 1) **API Standard 653** - Tank Inspection, Repair, Alteration, and Reconstruction.
- 2) **API Recommended Practice 920** - Prevention of Brittle Fracture of Pressure Vessels.

#### **3.2 Personnel Training and Discharge Prevention Procedures (40 CFR 112.7 (f))**

- 1) Personnel are properly instructed in the following:

- a. Proper operation and maintenance of equipment to prevent oil discharges,
- b. Discharge procedure protocols,
- c. Applicable oil spill prevention laws, rules and regulations,
- d. General facility operations, and
- e. The contents of facility SPCC plans and applicable pollution control laws, rules, and regulations.

Company and contract personnel attend in-house compliance awareness programs on a periodic basis. Compliance awareness briefings are conducted at least once per year to assure continued understanding of the applicable SPCC plans. In addition, spill related topics are discussed at safety meetings. Safety meeting topics include: spill control equipment; equipment operation and maintenance; inspection of containment structures, vessels, tanks and piping; spill response, containment and clean up; company policies on reporting and responding to spills; and specific SPCC Plans.

- 2) For the subject facilities, the designated person accountable for oil discharge prevention is:

Name: Jeff Odom  
Title: Supervisor

- 3) Scheduled prevention briefings for the operating personnel are conducted on a periodic basis to assure adequate understanding of the SPCC Plan. The briefing program is as follows:

A SPCC compliance awareness program is presented on an annual basis. The program includes a review of specific SPCC Plans, updates on state and federal regulations, company policy and procedures, and spill reporting.

Additional short briefing sessions are held as needed before and during certain jobs to review spill potential, necessary precautions and appropriate responses. Also, included in the briefing is a review of known spill events or failures, malfunctioning components and recently developed precautionary measures. A copy of the Training Record Form is attached in Appendix D.

- 4) Contractors working at the facilities are instructed as follows:

- A. Pollution control will be maintained at all times in connection with all operations by the contractor. Newfield Exploration Co. personnel will be notified immediately of any emitting, spilling, venting, discharging, disposal or loss of any hazardous or harmful substances, air contaminants and/or pollutants of any nature (referred to as discharges).

- B. If any discharges occur as a result of the performance of work by the contractor, its agents, employees and subcontractors, or other persons for whom the contractor is responsible, the contractor will immediately proceed to stop or abate such discharges.
- C. The contractor will comply with any and all local, state and federal laws, regulations, standards and orders applicable to the controlling and prevention of discharges.
- D. Contractors will install and maintain adequate discharge control equipment on or about their plant, rig or other equipment to prevent discharges, in violation of any local, state and federal laws, regulations, standards and orders.

#### **4.0 DRILLING AND WORKOVER OPERATIONS (40 CFR 112.10)**

Newfield Exploration Co. is committed to the preventing releases during drilling and workover operations. All drilling and workover contractors operating on company leases must have a written SPCC plan for their operations as required by 40 CFR 112.3(c). The contractor's plans must be implemented before operations are initiated. At a minimum the SPCC plans must comply with the general requirements of 40 CFR 112.7 and specifically address the following:

- 1) Drilling and workover equipment is to be positioned or located so as to prevent spilled oil, fuel, or oily drilling fluids from reaching navigable waters whenever possible. If necessary the use of catchment basins or diversion structures will be implemented
- 2) A blowout preventer (BOP) assembly and well control system is to be installed before drilling below any casing string and as required during workover operations.
- 3) The BOP assembly will be capable of controlling any expected wellhead pressure.
- 4) Casing and BOP installations will conform to industry standards and state regulations.

**SPCC APPENDIX A**

**CONTACT LISTS AND PHONE NUMBERS**

**RELEASE NOTIFICATION FORM**

**QUALIFIED DISCHARGE REPORT FORM**



## **SPCC NOTIFICATION LIST**

### **Newfield Exploration Co. Call List**

Jeff Odom / Field Supervisor  
Cell: 303-501-3551

Brad Rogers / HSE Specialist  
Cell: 303-621-5762  
Office: 303-383-4142

Michael Pontiff / HSE Coordinator – Rocky Mountains  
Cell: 832-457-2252  
Office: 303-382-4495

### **Emergency Response Contractors**

Mitchell's Oil Field Service / 406-482-4927

Backhoe/Dirt Work

Parka Inc. / 406-433-4346

Vacuum Truck

3 Way Inc. / 701-842-4124

Roustabout Crews

Power Fuels / 701-842-3610

Vacuum Truck

## **SPCC NOTIFICATION LIST FEDERAL, STATE AND LOCAL AGENCY CALL LIST**

If any oil contacts surface water, whether flowing or not, or an intermittent drainage, and results in a "visible sheen" on the water, the following phone contacts must be made as soon as possible following the discovery of the spill. The contacts must be made regardless of the quantity discharged.

- 1) National Response Center (The NRC should automatically contact the EPA)
- 2) The Regional office of the EPA
- 3) State Water Quality Control Division
- 4) State Oil and Gas Regulatory Agency
- 5) Any other state agencies with responsibility for oil pollution control
- 6) Affected land owners

**FOLLOW COMPANY REPORTING PROCEDURES SHOULD IT BECOME NECESSARY TO CONTACT ANY OF THE ABOVE AGENCIES. USE THE RELEASE NOTIFICATION FORM ON THE FOLLOWING PAGE TO ORGANIZE AND COMMUNICATE INFORMATION CONCERNING THE SPILL.**

### **FEDERAL AGENCIES**

National Response Center: (800) 424-8802  
EPA Region VIII Spill Line: (303) 293-1788  
EPA Region VIII: (303) 312-6312 (Working Hours) 1-800-227-8914 (24-Hour)  
BLM North Dakota Field Office (Dickenson, ND): (701) 227-7700

### **STATE AGENCIES**

North Dakota Industrial Commission Oil and Gas Division: (701) 328-8020  
North Dakota Department of Health Environmental Health Section: (701) 328-5210

### **LOCAL EMERGENCY RESPONSE AGENCIES**

Emergency Central Dispatch (Where Available - Local Calls Only) : 911

## RELEASE NOTIFICATION FORM

Should it become necessary to inform any federal or state agency concerning an accidental release, be prepared to provide the following information.

Reporter's Full Name: \_\_\_\_\_ Title: \_\_\_\_\_

Primary Phone Number: \_\_\_\_\_ Secondary Phone Number: \_\_\_\_\_

Company: \_\_\_\_\_ Office Address: \_\_\_\_\_

Spill Location: \_\_\_\_\_ Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ Rge. \_\_\_\_\_

Nearest City: \_\_\_\_\_ County: \_\_\_\_\_ State: \_\_\_\_\_

Directions From Nearest City to Spill Location: \_\_\_\_\_

Date and Time of Release: \_\_\_\_\_ Type of Material Released: \_\_\_\_\_

Source of the Material Release: \_\_\_\_\_

Total Quantity Released: \_\_\_\_\_ Quantity Released Into Water: \_\_\_\_\_

Container Type: \_\_\_\_\_ Container Material: \_\_\_\_\_

Container Storage Capacity: \_\_\_\_\_ Facility Storage Capacity: \_\_\_\_\_

Actions Undertaken to Correct, Control and Mitigate the Incident: \_\_\_\_\_

Description of Damages: \_\_\_\_\_

Number of Injuries: \_\_\_\_\_ Number of Deaths: \_\_\_\_\_

Evacuation(s) Conducted: \_\_\_\_\_ Number Evacuated: \_\_\_\_\_

## NOTIFICATION LOG

Agency Contacted	Contact Person	Date and Time of Contact
National Response Center (NRC)		
EPA Regional Office		
State Water Quality Division		
State Oil & Gas Commission		
BLM Field Office		
Forest Service		
Other: _____		
Other: _____		

## Information Submittal to EPA Regional Administrator for Qualified Discharge(s)

In the event of a qualified discharge or discharges, this form can be utilized to provide official notification to the EPA Regional Administrator. If a facility has experienced a discharge or discharges that meet one of the following two criteria, then this report must be submitted to the Regional Administrator within 60 days.

(Check as appropriate)

- ☐ This Facility has experienced a reportable spill as referenced in 40 CFR Part 112.1(b) of 1,000 gallons or more.
- ☐ This Facility has experienced two (2) reportable spills (as referenced in 40 CFR Part 112.1(b) of greater than 42 gallons each within a 12-month period.

Facility Name and Location: \_\_\_\_\_

Facility Contact Person (Name, address/phone number): \_\_\_\_\_

Facility Maximum Storage or Handling Capacity: \_\_\_\_\_

Facility Normal Daily Throughput: \_\_\_\_\_

Describe the Corrective Actions and Countermeasures Taken (include description of equipment repairs and replacements): \_\_\_\_\_

Describe the Facility (Attach maps, flow diagrams and topographical maps as necessary): \_\_\_\_\_

Describe the Cause of the Discharge (as referenced in 40 CFR Part 112.1(b)) Including Failure Analysis of the System: \_\_\_\_\_

Describe the Preventative Measures Taken or Contemplated to Minimize the Possibility of Recurrence: \_\_\_\_\_

Other pertinent information: \_\_\_\_\_

**NOTE: A copy of this report must also be sent to the appropriate state agency in charge of oil pollution control activities.**

**SPCC APPENDIX B**

**SPCC INSPECTION SUMMARY**

**PRODUCTION FACILITY SPCC EXAMINATION FORM**  
**AND**  
**INSPECTION FORMS**

## **SPCC INSPECTION SUMMARY**



# SPCC Inspection Summary

Facility: \_\_\_\_\_

## Stock tank and Pressure Vessel Summary

Stock Tank Description / Designation	Year of Construction	Pressure Vessel Description / Designation	Year of Construction	Risk Designation (High or Low) (1)

## Inspection History

Facility Examination (Annually)	Piping External Examination (Annually)	Piping Internal Inspections (2)	Tank External Examination (Annually)	Tank External Inspection (Within 15 years after construction)	Tank Internal Inspection/ Examination (3)	Pressure Vessel External Inspections (4)	Pressure Vessel Internal/ On-Stream Inspections (5)

**Notes:** 1 - Pressure vessel risk is categorized as high or low based upon three criteria:

- 1) potential for failure,
- 2) vessel history including operating conditions, age and remaining corrosion allowance, and
- 3) consequences of failure including location relative to employees, the public, and environmental receptors.

2 - Piping internal examinations may be conducted when equipment is shut-down for maintenance or repairs.

3 - Tank internal examinations are to be conducted when a tank is:

- a) cleaned, b) transferred to a new location, c) service is changed more than 5 years following an inspection, or d) entered for any type of maintenance or repair.

Internal tank inspections are to be conducted at 3/4 of the corrosive rate life as determined by external inspections.

4 -External inspections for pressure vessels categorized as low or high risk shall be performed:

when on-stream or internal inspections are performed or at shorter intervals at the owners option.

5 - On-stream or internal pressure vessel inspections shall be performed:

- at least every 15 years or 3/4-remaining corrosion life, whichever is less for low risk vessels, or
- at least every 10 years or 1/2-remaining corrosion life, whichever is less for high risk vessels.

## **PRODUCTION FACILITY SPCC EXAMINATION FORM**

# PRODUCTION FACILITY SPCC EXAMINATION FORM

Facility: \_\_\_\_\_ Date: \_\_\_\_\_

Circle the appropriate response. Note that any "No" response requires corrective actions.

## I. Wellheads

- |    |  |          |
|----|--|----------|
| A. | All shut-in wells should have 0 psi at the wellhead and tree:                                    | Yes / No |
| B. | All wellhead and tree connections should be leak free:   | Yes / No |
| C. | All active wells should have their master valves operating and serviced to assure they function: | Yes / No |

## II. Flowlines

- |    |  |          |
|----|--|----------|
| A. | All active flowlines are leak free:                              | Yes / No |
| B. | All visible flowlines are free from serious corrosion:           | Yes / No |
| C. | All active flowlines have a gauge installed to monitor pressure: | Yes / No |
| D. | Any clamp-type repairs on active flowlines are free from leaks:  | Yes / No |

## III. Process Equipment

- |    |   |          |
|----|---|----------|
| A. | All incoming flowlines (active and inactive) should be identified:                                | Yes / No |
| B. | Shut down valves are checked for fail-safe closure:   | Yes / No |
| C. | Header/manifold systems, process vessels and their interconnecting piping should be leak-free:    | Yes / No |
| D. | All automatic dump valves should be checked for fail-safe closure:                                | Yes / No |
| E. | Operating pressures on process vessels should be at or below the vessel's rated working pressure: | Yes / No |
| F. | Secondary containment system is intact and competent:   | Yes / No |

## IV. Tanks

- |    |   |          |
|----|---|----------|
| A. | All bulk storage tanks and their related piping are leak-free:          | Yes / No |
| B. | Secondary containment system is intact and competent:                   | Yes / No |
| C. | All pressure/vacuum reliefs and atmospheric tank vents are operational: | Yes / No |
| D. | Rainwater drain valve is kept in the closed position:                   | Yes / No |
| E. | Foundations and supports are stable and sufficient:                     | Yes / No |
| F. | Storage container are free of serious corrosion:                        | Yes / No |
| G. | Tanks have not experienced overflows:                                   | Yes / No |

V. General

- |    |  |          |
|----|--|----------|
| A. | Drainage ditches proximate to the site are free from oil:              | Yes / No |
| B. | Chemical injection systems are free from leaks:                        | Yes / No |
| C. | Lube oil systems are free from leaks:                                  | Yes / No |
| D. | Facility is graded to drain stormwater away from natural watercourses: | Yes / No |
| E. | Pits are free from oil:  | Yes / No |
| F. | Pits have at least 1 foot of freeboard:                                | Yes / No |
| G. | Liquid level in sumps is adequate to prevent overflow:                 | Yes / No |
| H. | Alarm systems operate properly:  | Yes / No |
| I. | Drip and drain pans are emptied as needed to prevent overflows:        | Yes / No |
| J. | Secondary containment for portable oil containers is adequate:         | Yes / No |
| K. | Stormwater siphons are free from debris and blockage:                  | Yes / No |
| L. | Pump seals and related piping are free from leaks:                     | Yes / No |

VI. Corrective Actions

---

---

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---

VII. Certification

- |    |                     |             |
|----|---------------------|-------------|
| A. | Original Inspection | By:_____    |
|    |                     | Title:_____ |
|    |                     | Date:_____  |
| B. | Corrective Actions  | By:_____    |
|    |                     | Title:_____ |
|    |                     | Date:_____  |

**INSPECTION FORMS:**

**PROCESS PIPING INSPECTION FORM**

**PRESSURE VESSEL INSPECTION FORM**

**STORAGE TANK INSPECTION FORMS**

## EXTERNAL INSPECTION CHECKLIST FOR PROCESS PIPING

### API 574 - Inspection Practices for Piping System Components

Facility: \_\_\_\_\_ Date: \_\_\_\_\_

Authorized Inspector: \_\_\_\_\_

#### A. 1 Leaks

- |                     |                                     |
|---------------------|-------------------------------------|
| a. Process.         | Adequate/Corrective Action Required |
| b. Stream tracing.  | Adequate/Corrective Action Required |
| c. Existing clamps. | Adequate/Corrective Action Required |

#### A. 2 Misalignment

- |   |                                     |
|---|-------------------------------------|
| a. Piping misalignment/restricted movement. | Adequate/Corrective Action Required |
| b. Expansion joint misalignment.            | Adequate/Corrective Action Required |

#### A. 3 Vibration

- |                                       |                                     |
|---------------------------------------|-------------------------------------|
| a. Excessive overhung weight.         | Adequate/Corrective Action Required |
| b. Inadequate support.                | Adequate/Corrective Action Required |
| c. Thin, small bore, or alloy piping. | Adequate/Corrective Action Required |
| d. Threaded connections.              | Adequate/Corrective Action Required |
| e. Loose supports causing metal wear. | Adequate/Corrective Action Required |

#### A. 4 Supports

- |                                   |                                     |
|-----------------------------------|-------------------------------------|
| a. Shoes-off support.             | Adequate/Corrective Action Required |
| b. Hanger distortion of breakage. | Adequate/Corrective Action Required |
| c. Bottomed-out springs.          | Adequate/Corrective Action Required |
| d. Brace distortion/breakage.     | Adequate/Corrective Action Required |
| e. Loose brackets.                | Adequate/Corrective Action Required |
| f. Slide plates/rollers.          | Adequate/Corrective Action Required |
| g. Counterbalance condition.      | Adequate/Corrective Action Required |
| h. Support corrosion.             | Adequate/Corrective Action Required |

#### A. 5 Corrosion

- |   |                                     |
|---|-------------------------------------|
| a. Bolting support points under clamps. | Adequate/Corrective Action Required |
| b. Coating/painting deterioration.      | Adequate/Corrective Action Required |
| c. Soil-to-air interface.               | Adequate/Corrective Action Required |
| d. Insulation interfaces.               | Adequate/Corrective Action Required |
| e. Biological growth.                   | Adequate/Corrective Action Required |

#### A. 6 Insulation

- |                                  |                                     |
|----------------------------------|-------------------------------------|
| a. Damage/penetrations.          | Adequate/Corrective Action Required |
| b. Missing jacketing/insulation. | Adequate/Corrective Action Required |
| c. Sealing deterioration.        | Adequate/Corrective Action Required |
| d. Bulging.                      | Adequate/Corrective Action Required |
| e. Banding (broken/missing).     | Adequate/Corrective Action Required |



## API RP 510 - Alternative Rules for Exploration and Production Pressure Vessels

### PRESSURE VESSEL

Form Date \_\_\_\_\_  
 Form No. \_\_\_\_\_  
 Owner or User \_\_\_\_\_  
 Vessel Name \_\_\_\_\_

Name of Process _____	Owner or User Number _____
Location _____	Jurisdiction/National Board Number _____
Internal Diameter _____	Manufacturer _____
Tangent Length/Height _____	Manufacturer's Serial No. _____
Shell Material Specification _____	Date of Manufacture _____
Head Material Specification _____	Contractor _____
Internal Materials _____	Drawing Numbers _____
Nominal Shell Thickness _____	
Nominal Head Thickness _____	Construction Code _____
Design Temperature _____	Joint Efficiency _____

Sketch or Location	Location Number	Original Thickness	Required Minimum Thickness	Date

Comments (See Note 2) \_\_\_\_\_  
 \_\_\_\_\_

Method \_\_\_\_\_

Authorized Inspector \_\_\_\_\_

- Notes:
1. Use additional sheets, as necessary.
  2. The location that each comment relates to must be described.

**API RP 12R1 - Recommended Practice for Setting, Maintenance, Inspection,  
Operation and Repair of Tanks in Production Service**

**Checklist for External Condition Examination**

**Identification**

Tank Designation: \_\_\_\_\_

Size: \_\_\_\_\_

Date of Inspection: \_\_\_\_\_

Measured or Estimated Liquid Level: \_\_\_\_\_

Contents: \_\_\_\_\_

**Foundation**

Tank Property Supported Yes / No

Grade Ring/Foundation Structurally Sound Yes / No

**Tank Bottom**

Visible Signs of Leakage Around Tank Bottom Yes / No

Adequate Drainage Away From Tank Yes / No

**Tank Shell**

Active Leaks Yes / No  
If Yes, Number & Location  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signs of Past Leakage Yes / No  
If Yes, Number & Location  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Structural Integrity (Distortions, Warping) Yes / No  
If Yes, Type & Location  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Coating Condition Satisfactory Yes / No  
If No, Type & Location  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Severe Corrosion and/or Pits Yes / No  
If Yes, Type & Location  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Checklist for External Condition Examination (Continued)

### Roof Deck

Holes	Yes / No
If Yes, Number & Location	

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Adequate Drainage off of Deck	Yes / No
Coating Condition Satisfactory	Yes / No
If No, Type & Location	

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Severe Corrosion and/or Pits	Yes / No
If Yes, Type & Location	

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### Appurtenances/Miscellaneous

Thief Hatch and Vent Valve Seals Air Tight	Yes / No
--	----------

Gas Blanket System Operational (If Applicable)	Yes / No
--	----------

Stairways/Walkways Structurally Sound	Yes / No
---------------------------------------	----------

Proper Warning Signs in Place	Yes / No
-------------------------------	----------

Dikes Maintained	Yes / No
------------------	----------

If Fiberglass Tank, All Metal Parts Bonded or Gas Blanket Operational	Yes / No
---	----------

Tank Area Clear of Trash & Vegetation	Yes / No
---------------------------------------	----------

Cathodic Protection System Operational	Yes / No
--	----------

Piping Properly Supported	Yes / No
---------------------------	----------

## Checklist for Internal Condition Examination

### Identification

Tank Designation: \_\_\_\_\_

Size: \_\_\_\_\_

Date of Inspection: \_\_\_\_\_

Measured or Estimated Liquid Level: \_\_\_\_\_

Contents: \_\_\_\_\_

### Tank Shell

Any Visual Leaks or Cracks \_\_\_\_\_ Yes / No  
If Yes, Number & Location

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Any Structural Integrity Problems (Distortions or Warping) \_\_\_\_\_ Yes / No  
If Yes, Number & Location

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Coating Condition Satisfactory \_\_\_\_\_ Yes / No  
If No, Type & Location

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Internal Corrosion (Severe Pits) \_\_\_\_\_ Yes / No  
If Yes, Type & Location

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Roof Deck

Holes \_\_\_\_\_ Yes / No  
If Yes, Number & Location

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Coating Condition Satisfactory \_\_\_\_\_ Yes / No  
If No, Type & Location

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Checklist for Internal Condition Examination (Continued)

Severe Corrosion and/or Pits If Yes, Type & Location	Yes / No
---	----------


Structural Supports or Rafters Damaged If Yes, Type & Location	Yes / No
---	----------


#### Appurtenances/Miscellaneous

Cathodic Protection System Satisfactory If No, Location & Problem	Yes / No
--	----------


## Checklist for External Inspection

### Identification

Tank Designation: \_\_\_\_\_

Size: \_\_\_\_\_

Date of Inspection: \_\_\_\_\_

Measured or Estimated Liquid Level: \_\_\_\_\_

Contents: \_\_\_\_\_

### Foundation

Tank Shell Adequately Supported	Yes / No
Tank Floor Level (No Differential Settlement)	Yes / No
Signs of Soil or Foundation Failure (Major Tank Settlement)	Yes / No
Grade Ring/Foundation Structurally Sound	Yes / No
Adequate Drainage Away from Tank	Yes / No

### Tank Bottom

Visible Signs of Leakage Around Tank Bottom	Yes / No
Bottom/Shell Connection Free of Cracks & Leaks	Yes / No

### Tank Shell

Tank Shell Patches	Yes / No
If Yes, Number & Location	
_____	
_____	
Tank Shell Abnormalities/Distortions	Yes / No
If Yes, Number & Location	
_____	
_____	
Visible Signs of Holes/Leaks	Yes / No
If Yes, Number & Location	
_____	
_____	
Cracks or Seepage in Seam	Yes / No
If Yes, Number & Location	
_____	
_____	
Cracks in Shell/Roof Seam	Yes / No
If Yes, Number & Location	
_____	
_____	
Condition of External Coating of Uninsulated Tanks, Holes, Disbonding, Deterioration, Discoloration	
Number & Location	
_____	
_____	



### Checklist for External Inspection (Continued)

Condition of Insulation Protection of Insulated Tanks, Shell Material (Holes/Tears). Number & Location

---

---

Seal Around Roof/Shell Joint (Separations). Number & Location

---

---

Seal Around Appurtenances (Separations). Number & Location

---

---

External Corrosion Yes / No

Tank Bolt/Rivets Corrosion Yes / No / NA  
If Yes, Number & Location

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---

Tank Fiberglass Delaminated Yes / No / NA  
If Yes, Number & Location

---

---

Results of Ultrasonic Measurements

In Vapor Zone

---

---

In Liquid Zone

---

---

#### Tank Roof Deck

Hatches Securely Closed Yes / No / NA

Roof Patches Yes / No  
If Yes, Number & Location

---

---

Roof Deck Abnormalities/Distortions Yes / No  
If Yes, Number & Location

---

---

Visible Signs of Holes/Leaks Yes / No  
If Yes, Number & Location

---

---

## Checklist for External Inspection (Continued)

Deck External Corrosion  
None, Minimal, Moderate, Severe

Adequate Drainage Off of Deck

Yes / No

Condition of External Coating of Uninsulated Deck, Disbonding, Deterioration, Discoloration  
Number & Location

Condition of Insulation Protection of Insulated Deck  
Roof Material (Holes/Tears). Number & Location

Seal Around Appurtenances (Separations). Number & Location

Results of Ultrasonic Thickness Measurements. (Compare to Original Values)

Results of Hammer Tests

### Appurtenances

Thief Hatch & Vent Valves Seal Properly

Yes / No

Thief Hatch Opens Freely W/O Plugging

Yes / No

Vent Valve Operational

Yes / No

Sample & Drain Valves Leak

Yes / No

Inspect Nozzle Seams for Cracks

Yes / No

Piping, and the like, Properly Supported Off of Tank

Yes / No

Tank Shell Dimpling at Connections

Yes / No

Metal Appurtenance Bonded OR Gas Blanket

Yes / No

Operational on Fiberglass Tank

Yes / No / NA

Stairways & Walkways Structurally Sound

Yes / No

## Checklist for External Inspection (Continued)

### Miscellaneous

Cathodic Protection Operational/Potential Adequate	Yes / No / NA
Vapor Recovery System Operational	Yes / No / NA
Gas Blanket System Operational	Yes / No / NA
Containment Dikes and/or Liner Maintained & Adequate Size	Yes / No / NA
Proper Warning Signs in Place	Yes / No
Automatic Level Indicator Operational & Accurate	Yes / No
(Compare to Hand Gauge Level)	Yes / No / NA
Tank Area Clean of Trash & Vegetation	Yes / No

### Recommended Future Action

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## Checklist for Internal Inspection

### Identification

Tank Designation: \_\_\_\_\_

Size: \_\_\_\_\_

Date of Inspection: \_\_\_\_\_

Measured or Estimated Liquid Level: \_\_\_\_\_

Contents: \_\_\_\_\_

### Pre-Inspection

Tank Properly Cleaned	Yes / No
Tank Atmosphere Properly Tested	Yes / No
Tank Properly Isolated	Yes / No
Tank Structurally Sound	Yes / No
Confined Space Entry Procedure Implemented	Yes / No

### Tank Bottom

Floor Adequately Supported (Limited Voids Under Floor Plate)	Yes / No
Floor Sloped for Adequate Drainage. If Low Spots Exist, Number & Location	Yes / No

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Plate Buckling/Deflection Acceptable	Yes / No
Visually Inspect & Record Plate & Weld Condition	

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Inspect Shell/Bottom Seam

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Condition of Internal Coating (Holes, Disbonding, Deterioration). Number & Location

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Inspect & Describe Pitting Appearance (Depth, Sharp Edged, Lake Type, Dense, Scattered)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Results of Ultrasonic Thickness Measurement

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### Checklist for Internal Inspection (Continued)

Results of Vacuum Tests

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Results of Penetrant Dye Tests

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Results of Hammer Tests

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Results of Other Testing (Magnetic Flux Leakage, Acoustical Emission and so forth)

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In Earthquake Zones 3 & 4, Roof Supports Restrained From Horizontal Movement Only  
(Not Welded to Floor)

Yes / No

**Identify Areas to Be Repaired.** Number & Location

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#### **Tank Shell**

Visually inspect & Record Plate & Weld Conditions. Number & Location

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Inspect & Describe Pitting Appearance. (Depth, Sharp Edged, Lake Type, Dense, Scattered, and so on)

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Condition of Internal Coating (Holes, Disbonding, Deterioration). Number & Location

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Survey Shell to Check Plumb & Roundness

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Results of Ultrasonic Thickness Measurements in Vapor Zone

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### Checklist for Internal Inspection (Continued)

In Liquid Zone

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Identify Areas to Be Repaired. Number & Location

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#### Tank Roof

Inspect & Describe Pitting Appearance (Depth, Sharp Edge, Lake Type, Dense, Scattered)

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Conditions of Internal Coating. (Holes, Disbonding, Deterioration) Number & Location

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Visually Inspect & Record Plate & Weld Conditions. Number & Location

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Results of Ultrasonic Thickness Measurements

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Check Roof Support Columns for:

Thinning in Vapor Zone

Thinning in Liquid Zone

Drain Opening in Bottom of Pipe or Concrete Filled

Proper Attachment to Roof & Bottom

Inspect Girders & Rafters for Thinning

Girders & Rafters Properly Secured

Yes / No

**Identify Areas to Be Repaired.** Number & Location

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## Checklist for Internal Inspection (Continued)

### Appurtenances

Visually Inspect All Seals & Gaskets  
Inspect & Service Pressure/Vacuum Hatches/Valves  
Inspect Gauge Well (If Existing)  
Inspect Internal Reinforcing Pads (If Existing) for Cracks  
Inspect Internal Nozzle Seams for Cracks, Corrosion, and the like  
Inspect Diffusers & Rolling Systems  
Inspect Swing Lines  
Inspect Wear Plates

### Recommended Future Action

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**SPCC APPENDIX C**

**STORMWATER INSPECTION PROCEDURE  
AND DRAINAGE RECORD**

## STORMWATER INSPECTION PROCEDURE AND DRAINAGE RECORD

Earthen berms, containment rings, and other containment structures are inspected on a regular basis for accumulations of oil and precipitation. These inspections are not typically documented. Generally, drainage from containment structures is not conducted. Minor accumulations of precipitation are allowed to evaporate. Large accumulations of fluids may be removed by vacuum truck and either returned to a separation vessel for processing or transported to a permitted recovery/disposal facility.

In the unlikely event that drainage events are conducted, the accumulated stormwater is visually inspected for contamination from oil. **NO** oil is released from or pumped from within the berm onto the ground or into a water course. Drainage or pumping does not occur until the fluids have been inspected for oil. Draining only occurs with constant visual supervision of the drain outlet, and only after determining that the water is indeed fresh. Draining ceases at the first sign of an oil sheen and the remaining fluid is removed and properly treated or disposed. The foreman in charge of the facility operations is consulted before any berm is drained or purged.

As required by law, any time that stormwater is discharged from the dike, a record of the inspection, discharge and oil removal is to be maintained. The following is the discharge record:

Date of Discharge	Oil Sheen Present	Inspector's Signature	Comments

**SPCC APPENDIX D**

**TRAINING RECORD FORM**

## TRAINING RECORD FORM

DATE: \_\_\_\_\_ TRAINER: \_\_\_\_\_

SUBJECT: \_\_\_\_\_

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ATTACH COPIES OF ALL HANDOUTS ETC.

NAME	SIGNATURE	COMPANY	JOB TITLE

**SPCC APPENDIX E**

**SPCC PLAN TECHNICAL AMENDMENT SUMMARY  
AND  
CERTIFICATIONS**



## AMENDMENT SUMMARY

The August 2010 SPCC plan for North Dakota has been amended as shown in the summary table, below. All amendments to the SPCC plan are further detailed in the following pages. Technical amendments include Professional Engineer Certifications in accordance with 40 CFR 112.5 (c).

Amendment Date	Purpose and Description of Amendment	Amendment Type (Administrative or Technical)	Amendment Certified by P.E. (Yes/No)
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

**Note:** P. E. certification is not required for administrative amendments.

## FIRST TECHNICAL AMENDMENT

Amendment Date	Purpose and Description of Amendment	Amendment Type (Administrative or Technical)	Amendment Certified by P.E. (Yes/No)
1.			

**New Facilities**

**Modified Facilities**

**Amendment Certification (40 CFR 112.5 (c))**

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## **SPCC APPENDIX F: FACILITY LIST**

The following facilities are included in this Plan Date SPCC Plan.

### **Sites Carried Over From January 2008 SPCC Plan:**

Abelmann 1  
Bratlien 1 41-33  
Bratlien 2 22-33  
Bratlien 4 24-33  
Bratlien 5 14-27  
Bratlien 7 13-34  
Burdick 1 12-28  
Burdick 3 24-20  
Gohrick 1-31  
Haystack 1  
Jackson 1-35H  
Jeffrey 33-33  
Papineau 5-13  
Plumer-Lundquist 25-2  
Schmitz 1-8  
Shae 21-33  
State 1-36A

### **Sites Included August 2010:**

Alice Federal 1-28H  
Arkadios 1-18H  
Bluefin 1-13H  
Clear Creek State 1-25H  
Clear Creek State 1-36H  
Garvey Federal 1-29H  
Gladys 2-9H  
Heidi 1-4H  
Manta Ray 1-12H  
Moberg 1-29H  
Olson 1-30H  
Pittsburgh 1-3H  
Rolfsrud 1-29H  
Sand Creek Federal 1-21H  
Sergeant Major 1-21H  
Trigger 1-31H

# Appendix H

## Biological Evaluation for Pittsburgh Federal 2H and 3H

**NEWFIELD PRODUCTION COMPANY**  
**Pittsburgh Federal 153-96-3-2H**  
**Well Pad and Access Road**  
**BIOLOGICAL EVALUATION**

T153N, R96W, S3 NW/NE  
McKenzie County, North Dakota  
December 6, 2010

**Prepared for:**  
Newfield Production Company

**By:**  
David Schmolter, Yellowfield Biological Surveys, LLC



## ABSTRACT

Yellowfield Biological Surveys, LLC, investigated the natural resources of proposed oil and gas well access road for Newfield Production Company. The project is located in T153N, R96W, S3 NW/NE in McKenzie County, ND. Existing conditions were documented and recommendations were provided to assist US Army Corps of Engineers to determine if the proposed activities adhered to the management intent of the Corps. The proposed 323' access road would depart from a US Forest Service road and cross reclaimed grasslands with crested wheatgrass (*Agropyron cristatum*). The proposed well pad would abut an existing well pad on the reclaimed grasslands and would be intersected by an existing access road. The well pad would extend into steep slopes above a wooded ravine. The slopes are dominated by little bluestem (*Andropogon scoparius*) and needlegrasses (*Stipa* sp.). The wooded ravine is dominated by green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americana*). Two oil well pads and 3.5 miles of oil service and ranch roads are within a 1-mile radius. The pastures are grazed by cattle. The project may affect one Candidate Species, two Monitored Species, and one Species Under Review. The project may affect individuals, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species. Best management practices should be used during activities to minimize disturbances and reduce effects as much as possible. In particular, erosion control measures are advised due to the short distance and steep channel gradients between the proposed well pad and Lake Sakakawea to reduce impacts upon the shoreline and shoreline species such as piping plover.

## INTRODUCTION

### PROPOSED ACTIVITIES

Newfield Production Company is proposing the construction of an oil well pad and 323' access road on T153N, R96W, S3 NW/NE in McKenzie County, ND. Details are in map in maps in the [Appendix A, Maps](#).

### SUMMARY

Company:	Newfield Production Company
Company Contact:	Eric Sundberg
Project Name:	Sand Creek Federal 253-96-32H
Project Type:	Oil well pad access road
Legal Description:	T153N, R96W, S3 NW/NE
County:	McKenzie
USGS Quadrangles:	Tulare-Sandwich Bay, ND 480505-81 T1402G
National Wetland Inventory Maps:	Tulare-Sandwich Bay, ND 480505-81 T1402G
Approximate Area Disturbance:	323' road and 10-acre oil well pad
Date of Field Survey:	August 8, 2010

## METHODS

### AREA SURVEYED

The project area was field surveyed on August 8, 2010, by David Schmoller and Amy Schmoller. The survey area comprised a 125' corridor on each side of the proposed 323' access road center line and 125' buffer around the proposed 10-acre well pad. In this project that amounted to about 21 acres.



## RESEARCH

The list of threatened and endangered species that could occur in North Dakota was obtained from the US Fish and Wildlife Service (FWS 2008). A FWS listing of species of concern and background information and habitat needs was obtained from the Northern Prairie Wildlife Research Center (FWS 1995).

The North Dakota Parks and Recreation Department (NDPR) was consulted for historic and potential occurrences of species of concern, including raptor nests and raptor species, in the project area. (NDPR December 2, 2010) Research for nearby projects on the Little Missouri National Grassland yielded additional rare species data. (DPR 2010) Other information was obtained from:

1. Personal knowledge of the area
2. FWS National Wetlands Inventory Data
3. US Geological Survey topographic maps
4. NNP aerial photographs

Prior to the field work, wildlife and plant characteristics and their habitats were studied to aid in field recognition.

## FEATURES OBSERVED

Vegetation composition and conditions, wildlife, raptor nests, and unusual features were assessed within the project area. Also, active roads, reclaimed roads, well sites, utility lines, stock tanks, water pipelines, or other developments were described. These observations were augmented by the research materials listed above.

## FIELD INSPECTION

Field surveys were conducted to determine the presence or absence of wildlife species of concern. Habitats within and near the immediate area of the proposed activities were evaluated. The search for raptor species of concern was based on field surveys for raptors, raptor nests and potential raptor habitat within the proposed project area. These observations were augmented by records of previous raptor or raptor nest sightings and aerial photo interpretation.

Field surveys were conducted too late to determine the presence or absence of rare plant species. However, only one rare plant is listed with the FWS, and that species, *Platanthera praecox*, exists only in the extreme southeastern corner of North Dakota, on the edge of wet swales in tallgrass prairie. This habitat does not exist in the project area. Hence, the late season survey was not a factor in the determination of impacts on rare plant populations. Nomenclature used follows McGregor et al., 1986.

Global Positioning System equipment (Garmin 60CSa) was used to record site and feature locations. A photographic record of the site was made.

## DETERMINATIONS

An evaluation, called a Biological Evaluation, was made as to the direct and cumulative effect of the proposed activities on 1) endangered species, 2) threatened species, 3) candidate threatened or endangered species, 4) monitored species, 5) species under review, and their 6) critical habitat. This determination was based upon research and field inspection and the evidence they gave of the presence or absence of the species and potential habitat within the project area. This included eagle nest sites and/or the eagle species and potential eagle habitat within the project area. For each species, the determinations were one of the following:

1. no effect,
2. not likely to adversely affect,
3. likely to adversely affect, or
4. beneficial effect.

The concern is whether the project would contribute to a trend toward federal listing or cause a loss of viability to the population or species.

## DESCRIPTION OF AREA

### GEOGRAPHY AND VEGETATION

Geologically, the survey area is within the Missouri Slope Uplands. Most of the surface geology in McKenzie County is Glaciated Missouri Plateau Section of the Great Plains Province. This section is characterized by glacial drift of the Colshar Group; a veneer of igneous and metamorphic Precambrian to Paleozoic glacial erratics, deposited during the Pleistocene Wisconsin glacial event. Where the glacial drift is absent, the Paleocene mudstone and siltstone of the Sentinel Butte formation is at the surface. The underlying Bullion Creek formation is exposed at lower elevations, mainly in the breaks along the main rivers and creeks. These waterways include the Missouri, Little Missouri, Tobacco Garden, Magpie, Belcegal, and Bennett. In the breaks, the geomorphology has an undulating, rugged aspect with buttes, steep-sided canyons, and badland outcrops. Landslides, slumps, and mass wasting are common. Updome from the breaks, the landscape levels off, is less severe in aspect, and has a thicker mantle of glacial veneer. The crests of the Blue Buttes and some hills near Grassy Butte contain siltstones, claystones, and sandstones from the late Paleocene/early Eocene Golden Valley formation. Other geologic features include clinker, or porcelainite, beds, lignite veins and sandstone concretions, relicts of ancient river channels. Across the landscape is more recent erosional debris from the late Quaternary period.

The project area lies within two Ecoregions: the Missouri River Breaks Ecoregion and the Missouri Plateau Ecoregion. This project is located within the mixedgrass prairie province. The project area is mostly **Mixedgrass Prairie**. The proposed access road and well pad are situated on a tableland that is reclaimed grassland. Crested wheatgrass (*Agropyron cristatum*) and smooth brome (*Bromus inermis*) dominate. **(Figure 1)** There are small patches of blue grama (*Bouteloua gracilis*)/green needlegrass (*Stipa viridula*)/needle-and-thread (*Stipa comata*) grassland associations and some western snowberry (*Symphoricarpos occidentalis*). To the southeast and east, the survey area extends over the edge of the tableland onto steep sided slopes that descend rapidly toward an unnamed, intermittent creek that empties into Lake Sakakawea, 1/2 mile to the north. The slopes are dominated by little bluestem (*Andropogon scoparius*), prairie sandreed (*Calamovilfa longifolia*), cudweed sagewort (*Artemisia ludoviciana*), Canada anemone (*Anemone cylindrica*), dotted gayfeather (*Ulitia punctata*), stiff sunflower (*Heliopsis rigida*) and purple coneflower (*Echinacea angustifolia*). **(Figure 2)** The ravines are dense wooded draws with green ash (*Fraxinus pennsylvanica*)/American elm (*Ulmus americana*)/chokocherry (*Prunus virginiana*) habitat. **(Figure 2)** The walls of the ravine are nearly continuous, unvegetated badland outcrops. **(Figure 3)**

### FEATURES

A major feature is an active oil well that abuts the proposed oil well pad and an existing access road to the active oil well that intersects the proposed oil well pad. The oil well was being drilled at the time of the survey. **(Figure 4)** Other oil service structures are widespread in the area. These include pipelines, storage tanks, well pads, access roads, service buildings, and drilling rigs. Two well pads are within a mile radius of the survey area. Lake Sakakawea is 0.56 mile directly north of the survey area and is 0.70 mile downstream from well pad following the creekbed of the unnamed creek. Cattle grazing occurs in the survey area. Hayfields are 1.75 miles to the west on private land. Some pastures in the project are a mix of private and US Forest Service land. Fence lines delineate the private and public land boundaries. Road density is low.



**Figure 2.** Crested wheatgrass and smooth brome, standard reclamation grasses, dominate the tablelands. Access road stake is in foreground. To the right is the existing access road. Lake Sakakawea is in background. Oil drilling rig is to left. View is to NE.



**Figure 3.** Well pad corner stake (25075) is in foreground. Proposed well pad extends onto steep sided slopes above wooded ravine. Ravine has American elm and green ash. It empties into Lake Sakakawea, 0.70 miles downstream. Sideslope has reedgrass and little bluestem. View is to E.





Figure 3. Badland walls that line the unnamed, intermittent creek that empties into Lake Sakakawea, 0.7 mile to the NE. The proposed well pad is on the tableland to the extreme right. View is to NE.



Figure 4. Drilling operations on oil well during survey. The existing oil well pad abuts the proposed pad, the access road intersects the proposed pad. Stake in foreground is proposed oil wellhead. View is to NE.

## BIOLOGICAL EVALUATION

The following evaluation is being made to facilitate the FBIR decision making process. The existing conditions documented below may assist FBIR personnel to determine if the proposed activities appropriately adhere to the overall management intent of the FBIR. A summary of the evaluation is found in *Table 1, Effects Summary*.

### GENERAL

Design criteria are provided to avoid potential future effects unless there is a "no effect" determination. If there are no adverse effects now or in the future, no avoidance measures are necessary.

### ENDANGERED SPECIES

#### *Gray Wolf*

Based on the historical records there have been no wolf sightings within or near the project area. It is unlikely that wolves would inhabit this area. The proposed project will have **no effect** on the gray wolf.

#### *Black-footed Ferret*

Black-footed ferrets were historically found in North Dakota, mostly in the southwest portion of the state. They have been extirpated from the state. The Black-footed Ferret Recovery Plan lists the need to reintroduce ferrets into suitable habitat. Since they rely almost exclusively on prairie dogs for food and den sites, suitable Black-footed ferret habitat is large prairie dog towns or complexes of towns in close proximity to each other.

The nearest Black-footed ferret population is about 200 miles to the southeast in Dewey County, SD. The nearest proposed area of reintroduction is 45 miles to the southwest of the proposed project. No prairie dogs were observed in the project area. The proposed project will have **no effect** on the black-footed ferret at this time.

#### *Whooping Crane*

According to the Canadian Wildlife Service (CWS) and the FWS recovery plan, "areas characterized by wetland mosaics appear to provide the most suitable stopover habitat. In states and provinces, excluding Nebraska, whooping cranes primarily used shallow, seasonally and semi-permanently flooded palustrine wetlands for roosting, and various cropland and emergent wetlands for feeding. Large palustrine wetlands included in this category (and the number of confirmed sightings through spring 2005) are: large reservoir margins in the Dakotas. During migration, whooping cranes often are recorded in riverine habitats. Frequently used riverine habitats (and the number of confirmed sightings through spring 2005) include: the Missouri River in North Dakota." (CWS 2007)

The Missouri River, that is, Lake Sakakawea, is 0.5 miles (0.9 km) to the north of the project area. The Yellowstone River is 45 miles (72 km) to the southwest of the project area. Potential roost habitat does not exist in the survey area. The proposed project will have **no effect** on the whooping crane or its habitat.

#### *Interior Least Tern*

According to the FWS recovery plan, "interior least terns breed in the Mississippi and Rio Grande River Basins from Montana to Texas and from eastern New Mexico and Colorado to Indiana and Louisiana. From late April to August they occur primarily on barren to sparsely vegetated riverine sandbars, dike field sandbar islands, sand and gravel pits, and lake and reservoir shorelines. Threats to the survival of the species include the actual and functional loss of riverine sandbar habitat. Channelization and impoundment of rivers have directly eliminated nesting habitat." Essential breeding habitat in North Dakota for interior least tern is described as the "Yellowstone River and Missouri River between Garrison Dam and the Cannonball River." (FWS 1990)

The Missouri River, that is, Lake Sakakawea, is 0.5 miles (0.9 km) to the north of the project area. The Yellowstone River is 45 miles (72 km) to the southwest of the project area. There is no existing or potential habitat within the area surveyed. The proposed project will have **no effect** on the interior least tern or its habitat.

### ***Pallid Sturgeon***

The pallid sturgeon is known only to occur in the Missouri and Yellowstone Rivers. The Missouri River, that is, Lake Sakakawea, is 0.5 miles (0.9 km) to the north of the project area. The Yellowstone River is 45 miles (72 km) to the southwest of the project area. Reproduction of the pallid sturgeon the Missouri or Yellowstone Rivers has not been documented in 33 years. (Krentz 1992) At this distance, the proposed project will have **no effect** on the pallid sturgeon or its habitat.

## **THREATENED SPECIES**

### ***Piping Plover***

Critical habitat for the piping plover (shoreslines of alkali wetlands and lakes) occurs along the Missouri River, that is, Lake Sakakawea, at a point 0.5 miles (0.9 km) to the north. (FWS 2002) At this distance, disturbances created by the proposed access road and well will have **no effect** on the piping plover or its habitat.

### ***Western Prairie Fringed Orchid***

The distribution of the western prairie fringed orchid in the Dakota Prairie Grasslands is limited to the Shyanne National Grassland in southeastern North Dakota. The proposed project will have **no effect** on the western-fringed prairie orchid or its habitat.

## **CANDIDATE SPECIES**

### ***Dakota Skipper***

The Northern Prairie Wildlife Research Center (NPWRC) states that "the Dakota skipper can survive only in undisturbed tall grass and mid-grass prairie. In the western part of its range the Dakota skipper can be found in ungrazed native pastures with little bluestem, needle-and-thread and purple coneflower" and "upland (dry) prairie on ridges and hillsides dominated by bluestem grasses, needlegrass, pale purple coneflower (*Echinacea pallida*), prairie coneflowers (*Ratibida cuneifera*), and blanketflower (*Gallardia aristata*)." (FWS 1995) It is also found in association with harebell (*Campanula rotundifolia*), white prairie clover (*Oxalis candida*), fleabanes (*Erigeron*), black-eyed Susans (*Rudbeckia hirta*), and evening primrose (*Oenothera scutellata*). It appears to prefer purple coneflower (*Echinacea purpurea*) and, to a lesser extent, harebell as nectar sources. They are not found on habitats dominated by exotic plant species. Pupation takes about 10 days and occurs in mid-June to early July. Males emerge as adults about five days before females. They mate during this flight period, which lasts a maximum of about three weeks.

The survey area has relatively undisturbed little bluestem habitat on the sideslopes along the ravines and wooded draws. Pale purple coneflower is widespread. (Figure 5) However, the majority of the disturbance zone is within the tableland that is dominated by non-native crested wheatgrass and smooth brome. The US Forest Service reports "numerous sightings of various sensitive butterflies" throughout the general area. No Dakota skippers were observed in this survey. The project has the potential to adversely affect individuals. But the relatively small size of the project, the positioning adjacent to existing disturbance, and the prevalence of non-native grasses indicates that it will not likely contribute to a trend toward federal listing or loss of viability to the population or species.

### **Design Criteria to avoid potential future adverse effects**

Best management practices should be used during activities to minimize disturbances and reduce impacts as much as possible.





Figure 5. Black seedheads of purple coneflower on hillside below tableland. Drilling rig is in background. View is to NE.

### Greater Sage Grouse

While some suitable, big sagebrush (*Artemisia tridentata*) habitat exists in the county, the nearest known greater sage grouse populations are restricted to the far southwest corner of North Dakota. The nearest territorial males or pairs were seen in northern Billings County, 60 miles (100 km) away. The bulk of the populations are in Bowman County, 130 miles (210 km) away. There will be no effect to this species or its habitat at this time.

## DESIGNATED CRITICAL HABITAT

### Piping Plover

According to the FWS recovery plan (FWS 2002), critical habitat for the piping plover includes:

1. shallow, seasonally-to permanently-flooded alkali lakes or wetlands,
2. springs and fens along the edges of alkali lakes or wetlands,
3. uplands within 200 ft of alkali lakes or wetlands,
4. sparsely vegetated areas associated with the Missouri River, and
5. sparsely vegetated areas associated with Lake Sakakawea and Lake Oahe.

According to the FWS, critical habitat for the piping plover (shorelines of alkali wetlands and lakes) occurs along the Missouri River, that is, Lake Sakakawea, at a point 0.5 miles (0.9 km) to the north. (FWS 2002) At this distance, disturbances created by the proposed access road and well will have no effect on the piping plover or its habitat.

## MONITORED SPECIES

### Bald Eagle

Bald eagles prefer large, supercanopy trees with sturdy horizontal branches for nesting and winter roosting and a clear flight path to water. Most often these are cottonwoods found along larger rivers such as the Missouri, Little Missouri, or Yellowstone, the nearest of which is 0.5 miles to the north. Such habitat does exist within the project area. Large cottonwood (*Populus deltoides*), green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americana*) occur throughout the area in the wooded draws and creek bottoms. The nearest wooded draw is 75 feet (23 m) to the south of the edge of the proposed well pad. But no eagles or nests in tall trees or nest sites were observed within the project area and there are no historical records of such. (NDPR 2010, DPG 2010) These favorable habitat conditions indicate that the project has the potential to adversely affect individuals. But the small scope of the project and its position adjacent to existing disturbance indicates that it will not likely contribute to a trend toward federal listing or less of viability to the population or species. It is recommended that the following design criteria be used during construction:

#### Design Criteria to avoid potential future adverse effects

Best management practices should be used during activities to minimize disturbances and reduce impacts as much as possible. Any activities should be completed prior to February 1, at which time raptors will return to the area and resume the breeding and nesting period. This period continues to August 15 for hawk and eagles. If construction of the project is delayed or continues into the spring or summer of future breeding seasons, an aerial

raptor survey should be performed to search for new nests to ensure that no raptors of concern would be disturbed by the proposed activities.

### **Golden Eagle**

Although no golden eagles or large nests in tall trees were seen during the field surveys and no records exist of golden eagles or nest sites within the project area (MOPR 2010, DPG 2010), suitable golden eagle habitat exists in the area, in the form of badland buttes, cliffs, and large trees. Large cottonwood (*Populus deltoides*), green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americana*) occur in the wooded draws and creek bottoms. The wooded draws are within 75 feet (23 m) of the proposed well pad. These favorable habitat conditions indicate that the project has the potential to adversely affect individuals. But the small scope of the project and its position adjacent to existing disturbance indicates that it will not likely contribute to a trend toward federal listing or loss of viability to the population or species. It is recommended that the following design criteria be used during construction:

#### **Design Criteria to avoid potential future adverse effects**

Best management practices should be used during activities to minimize disturbances and reduce impacts as much as possible. Any activities should be completed prior to February 1, at which time raptors will return to the area and resume the breeding and nesting period. This period continues to August 15 for hawk and eagles. If construction of the project is delayed or continues into the spring or summer of future breeding seasons, an aerial raptor survey should be performed to search for new nests to ensure that no raptors of concern would be disturbed by the proposed activities.

### **SPECIES UNDER REVIEW**

#### **Sprague's Pipit**

A 2010 status review found that "listing Sprague's Pipit as threatened or endangered is warranted, but that listing the species at this time is precluded by the need to complete other listing actions of a higher priority." (FWS 2010)

The NFWRC states that Sprague's pipit is "fairly common locally on the Northwestern Drift Plain, Missouri Coteau, Coteau Slope, and Little Missouri Slope; uncommon and local on the Northeastern Drift Plain, Southern Drift Plain, and Missouri Slope." Nine sightings of territorial males or pairs were recorded up to 1972 in McKenzie County and 12 were recorded across the Missouri River in Mountrail County. According to the North Dakota Species of Conservation Priority Accounts, Sprague's pipit requires "extensive tracts of native mixed-grass prairie, ungrazed or lightly grazed prairie." It continues:

"Sprague's pipit requires native grasslands of intermediate height and sparse to intermediate vegetation density, low forb density, and little bare ground but low litter depth. Introduced grasslands may be utilized, but to a much lesser extent. Pipits are most abundant in idle grasslands, but are tolerant of light to moderate grazing. Abundance positively correlated with percent forb cover and dominated by native grass species. Negatively correlated with high percent grass cover, litter depth, low-growing shrubs, and plant communities of Kentucky bluegrass. Avoid areas with woody vegetation and deep litter. The species appears area sensitive, requiring large grasslands of at least 190 ha."

Migration occurs between April and October. In Montana, fall migration normally begins at the end of August. Breeding activity is from late April to early September, peaking from early May to August. Some speculate that the species rears two broods each year. Nestlings have been recorded as late as August 2 in North Dakota. The latest recorded singing male in North Dakota was on September 6. The latest recorded migratory Sprague's pipit in Montana was in October.

Extensive tracts of native mixed-grass prairie are common in the area, particularly on the sideslopes. The grasslands in the survey area tend to be reclaimed grasslands dominated by non-native grasses. The US Forest Service reported "various observations of Sprague's pipit and Baird's sparrow throughout the general area". (DPG 2010) The field surveys occurred at the tail-end of the normal breeding period, and it may have been possible to hear their songs during the survey. However, all birdongs in the survey area were overwhelmed by the noise

generated at the adjacent well pad by drilling operations. In view of the incidence of Sprague's pipit in the area, the project may have effects upon individuals, but it is not expected to contribute to a trend toward federal listing or loss of viability to the population or species.

#### Design Criteria to avoid potential future effects

Best management practices should be used during activities to minimize disturbances and reduce effects as much as possible.

Table 1. Effects Summary

SPECIES	EFFECT			
	NONE <sup>1</sup>	MAY <sup>2</sup>	WILL <sup>3</sup>	BENEFICIAL
<b>Endangered</b>				
Gray wolf ( <i>Canis lupus</i> )	X			
Black footed ferret ( <i>Mustela nigripes</i> )	X			
Whooping crane ( <i>Grus americana</i> )	X			
Inland least tern ( <i>Sterna antillarum</i> )	X			
Pallid sturgeon ( <i>Acipenser schistosus</i> )	X			
<b>Threatened</b>				
Piping plover ( <i>Charadrius melodus</i> )	X			
Western prairie fenced cuckoo ( <i>Phainopepla nitens</i> )	X			
<b>Candidate</b>				
Dakota skipper ( <i>Hesperia dactylus</i> )		X		
Greater sage grouse ( <i>Centrocercus urophasianus</i> )	X			
<b>Designated Critical Habitat</b>				
Piping plover habitat	X			
<b>Monitored</b>				
Bald eagle ( <i>Haliaeetus leucocephalus</i> )		X		
Golden eagle ( <i>Aquila chrysaetos</i> )		X		
<b>Species Under Review</b>				
Sprague's pipit ( <i>Ammodramus spraguei</i> )		X		

<sup>1</sup> no effect at this time.

<sup>2</sup> may affect individuals or habitat, but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.

<sup>3</sup> will affect individuals or habitat with a consequence that the action may contribute to a trend toward federal listing or cause a loss of viability to the population or species.

## DISCUSSION

### CONDITIONS

The proposed access road would be within a few yards of an existing access road. The proposed well pad would be adjacent to an existing well pad and would overlap an existing access road. The entire survey area is grazed by cattle. Oil wells, pads, roads, pipelines, storage tanks, and equipment lots are scattered across the county. Well pad and road density is low: two oil wells and about 3 miles of access and ranch roads are within a 1-mile radius of the project.

### SPECIES AFFECTED

The project may affect one **Candidate Species**, two **Monitored Species**, and one **Species Under Review**. The project may affect individuals, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species. Best management practices should be used during activities to minimize disturbances and reduce effects as much as possible. The proposed activities will not have any adverse effects on the remaining **Endangered or Threatened species or Designated Critical Habitat**.

## EFFECTS

Since the settlement of the northern Great Plains, urbanization, agriculture and industry have altered the nature of much of the landscape. The original integrated ecosystem has been fragmented, reformatted, or eliminated altogether. This has resulted in relatively small units of agriculture, industry and native communities that are often at odds with each other.

Fencing, roads, powerlines, waterlines, well pads, storage facilities and other oil and cattle industry developments have produced dozens of miles of linear disturbances and dozens of acres of area disturbances within a 1-mile radius of the survey area. The addition of the proposed oil and gas well access road would increase the linear disturbances by about 900 feet (275 m); area disturbances would increase by about 10 acres (4 ha), assuming a 50-foot (15 m) wide disturbance zone along the road.

While the project itself would have minor impacts in comparison to the developments in place throughout FBR, repeated disturbances and an accumulation of individual impacts could eventually result in an adverse cumulative impact on the habitat and/or populations of rare species. Cumulative effects to natural populations may include the introduction of non-native plant species, habitat fragmentation, loss of corridors, decreased vegetative structure, decreased floristic diversity, reduction of populations or habitat below critical threshold levels, or complete elimination of populations or habitat. In turn, some of these cumulative effects would accelerate other adverse conditions. For example, habitat fragmentation accelerates the decline of a habitat below critical threshold levels.

## RECOMMENDATIONS

Yellowfield Biological Surveys, LLC, recommends the approval of this project with incorporation of the design criteria below:

Best management practices should be conducted in a manner to avoid or minimize cumulative effects to natural plant and animal populations. This can produce major improvements in the ecological outcomes. In general, the best management practice is to limit disturbances as much as possible. This has several benefits: it reduces habitat fragmentation, noxious weed opportunities and the loss of suitable habitat, vegetative structure and floristic diversity.

Specifically, these management practices are advised: While noxious weeds are likely to remain a threat in the grasslands on private and public lands, care can be taken to control further spread of invasive species into the area by cleaning equipment and periodically monitoring the project area. This is important in this project because the proposed waterline would travel through so much disturbed habitat, creating a greater potential for distribution of non-native species during construction. Because of this threat, periodic monitoring of weed populations should be made to determine the need for biological or chemical control measures. Effects on vegetative structure can be reduced by avoiding woody plants and wetland areas in particular. Floristic diversity can be aided by reclamation practices such as the restoration of topographical diversity, uneven distribution of topsoil, and avoidance of planting aggressive cultivars. Reclamation of the site should follow specifications set forth by the USFS. Isolated weed patches should be treated with herbicide prior to disturbances.

Again, regarding golden and bald eagles, it is recommended that any activities should be completed prior to February 1 or begun after August 15 to avoid the breeding and nesting period. If construction of the project is delayed or is expected to continue into the spring or summer of future breeding seasons, it is recommended that an aerial raptor survey be performed to search for new nests to insure that no raptors of concern would be disturbed by the proposed activities.

While the distance between the project and Lake Sakakawea is beyond the 200-foot limit recommended by the FWS recovery plan for piping plover, the position of the proposed well pad is of concern. The pad would lie at the edge of very steep slopes above a wooded ravine and intermittent creek. Water in the creek would travel 0.20 mile before emptying into Lake Sakakawea. Hence, erosion control measures are advised to reduce impacts upon the shoreline, piping plover, and other aquatic or shoreline species of concern.



Any future sightings of species of concern in the project area should be reported to the NDPS and FWS in Bismarck, ND.

## LIMITATIONS

Despite the survey and research efforts, findings and determinations are not absolute nor are they infallible. The fact remains that absence of evidence does not constitute evidence of absence. At times, field surveys do not necessarily coincide with prime survey windows, such as best plant phenology, bird breeding season, or adult flight of butterflies. Mobile species might not be in the survey area or in open view at the time of the survey. Objects or weather conditions may obscure the species or impair visibility. In many cases, a given species may have a wide tolerance for habitats, while in other cases the habitat required by a species has not been closely studied and therefore has been vaguely identified. This makes it difficult to anticipate whether a species will occur on an area or not. Evidence may be limited by the conditions under which it is gathered and determinations are as limited as the evidence upon which they are based.

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## APPENDIX A. MAPS

### A.1. Aerial Photograph of Survey Area



Blowfield Production Company, Pittsburgh Federal K253 (E-3-2H), Well Pad and Access Road

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A.2. Topographic Map of Survey Area

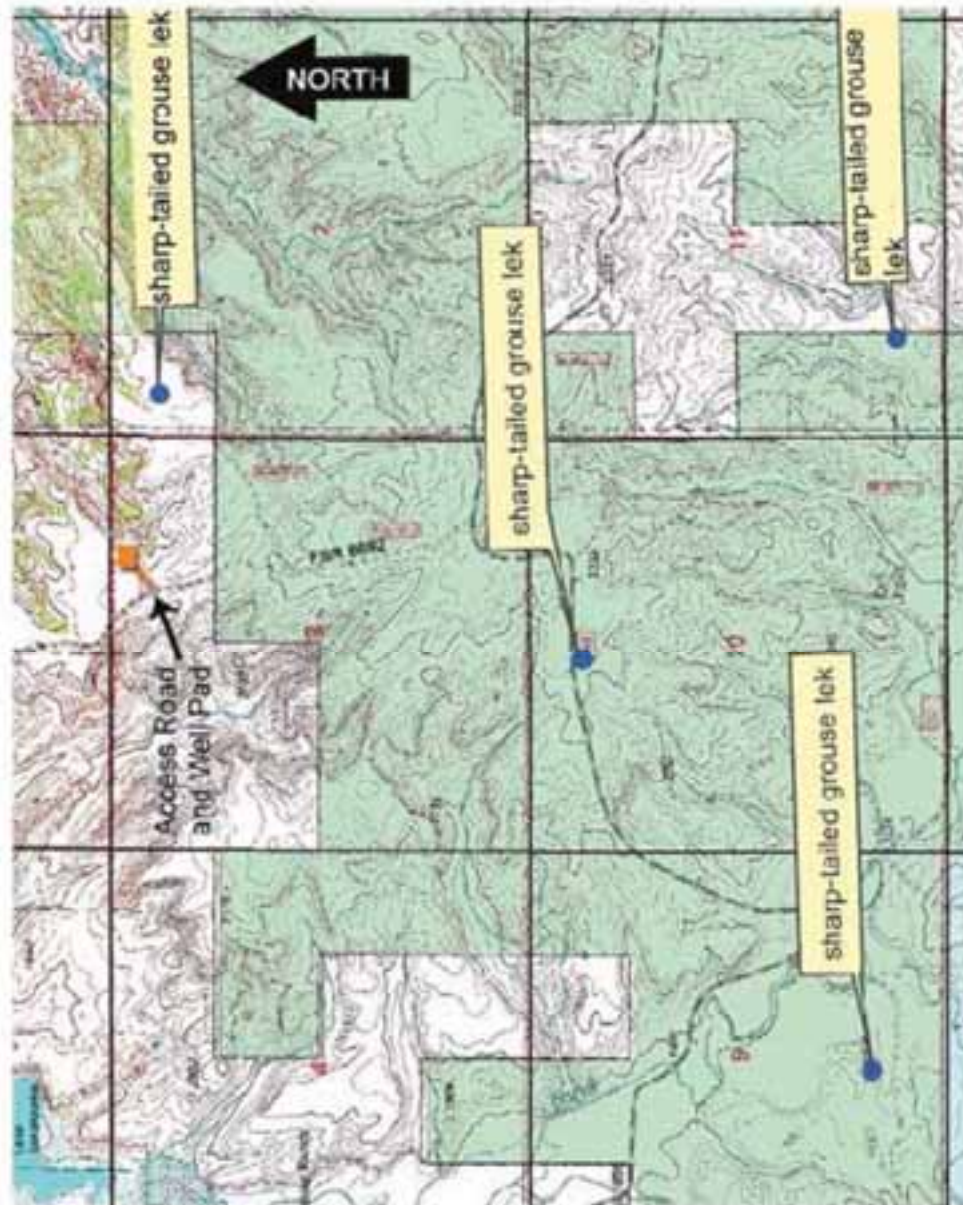


Dots show road survey stakes and well pad stakes.

Newfield Production Company, Pittsburgh Federal K253 (E-3-2H), Well Pad and Access Road

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A.3. DPG Map of Rare Species in Survey Area





# **Appendix I**

## **Summary of Field Survey/Biological Site Inventory for Adjacent XTO Well Site**

**Summary of Field Survey/Biological Site Inventory  
McPete Federal and White Federal 34X-34 – Well Site and Access Road  
McKenzie County, North Dakota**

### Wildlife Survey

Numerous resident and migratory birds, mammals, amphibians and insects occupy the Site both continually and intermittently throughout the year. Due to the migratory and transient behavior of wildlife species, the information presented includes a discussion of wildlife resources known within the Site and at a regional level, obtained from queries of state and federal natural resource related databases, and interviews with state (NDGFD 2008) and federal management personnel (USFWS 2008a, 2008b). Focus was also given to land cover and potential habitat availability of the Site, which includes mixed grass prairie, tree and shrub cover.

Eighteen resident birds are known from McKenzie County (Table 1). At least seventy-one migratory birds could potentially occur in the vicinity of the Site (Table 2). These lists should not be considered comprehensive, but rather representative of the majority of species regularly present in the vicinity of the project area. Based on a lack of suitable waterfowl nesting habitat present within the Site relative to eastern portions of the state, only limited use of the area (except staging on Lake Sakakawea, ½ mile north from the project area) by migrating waterfowl species would be expected.

**Table 1. Resident Bird Species in McKenzie County**

Common Name	Scientific Name
American Crow	<i>Corvus brachyrhynchos</i>
Black-billed Magpie	<i>Pica hudsonia</i>
Black-capped Chickadee	<i>Parus atricapillus</i>
Blue Jay	<i>Cyanocitta cristata</i>
Short-eared Owl	<i>Nyctalestus flammeus</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Eastern Screech Owl	<i>Aotis asio</i>
European Starling	<i>Sturnus vulgaris</i>
Gray Partridge	<i>Perdix perdix</i>
Great Horned Owl	<i>Bubo virginianus</i>
Hairy Woodpecker	<i>Picoides villosus</i>
House Finch	<i>Carpodacus mexicanus</i>
House Sparrow	<i>Passer domesticus</i>
Ring-necked Pheasant	<i>Phasianus colchicus</i>
Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>
Wild Turkey	<i>Meleagris gallopavo</i>
Horned Lark	<i>Eremophila alpestris</i>
Source: Sibley, D.A. 2006 The Sibley Field Guide to Bird of the Eastern United States; North Dakota Game and Fish Department.	

Table 2. Migratory Bird Species in McKenzie County

Common Name	Scientific Name
American Coot	<i>Fulica americana</i>
Marbled Godwit	<i>Limosa fedoa</i>
American Goldfish	<i>Physalis dominica</i>
Franklin's Gull	<i>Leucis pipitcan</i>
American Kestrel	<i>Falco sparverius</i>
Loggerhead Shrike	<i>Lanius ludovicianus</i>
American Robin	<i>Turdus migratorius</i>
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>
American Tree Sparrow	<i>Spizella arborea</i>
Mallard	<i>Anas platyrhynchos</i>
Bank Swallow	<i>Riparia riparia</i>
Marsh Wren	<i>Castrothorus palustris</i>
Gray Catbird	<i>Dumetella carolinensis</i>
Mountain Bluebird	<i>Sialia currucoides</i>
Mourning Dove	<i>Zenaidura macroura</i>
Killdeer	<i>Charadrius vociferans</i>
Northern Flicker	<i>Colaptes auratus</i>
Least Flycatcher	<i>Empidonax minimus</i>
Western Meadowlark	<i>Sturnella neglecta</i>
Lesser Yellowlegs	<i>Tringa flavipes</i>
Common Nighthawk	<i>Chordeiles minor</i>
Great Blue Heron	<i>Ardea herodias</i>
Willet	<i>Catoptrophorus semipalmatus</i>
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>
Yellow Warbler	<i>Dendroica petechia</i>
Canada Goose	<i>Branta canadensis</i>
Barn Swallow	<i>Hirundo rustica</i>
Blue-winged Teal	<i>Anas discors</i>
Belted Kingfisher	<i>Megasceryle alcyon</i>
Gadwall	<i>Anas strepera</i>
Red-Headed woodpecker	<i>Melanerpes erythrocephalus</i>
Northern Shoveler	<i>Anas chipeata</i>
Black Tern	<i>Chlidonias niger</i>
American Widgeon	<i>Anas americana</i>
Black-bellied Plover	<i>Physalis squataola</i>
Ruddy Duck	<i>Oxyura jamaicensis</i>
Bonaparte's Gull	<i>Larus philadelphia</i>
Turkey Vulture	<i>Cathartes aura</i>
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Brown Thrasher	<i>Toxostoma rufum</i>
Northern Harrier	<i>Circus cyaneus</i>



Brown-headed Cowbird	<i>Molothrus ater</i>
American Avocet	<i>Recurvirostra americana</i>
Bufflehead	<i>Bucephala albeola</i>
Greater Yellowlegs	<i>Tringa melanoleuca</i>
Cedar Wax wing	<i>Bombycilla cedrorum</i>
Chipping Sparrow	<i>Spizella passerina</i>
Rough-legged hawk	<i>Buteo lagopus</i>
Common Yellowthroat	<i>Geothlypis trichas</i>
Ruby-throated Hummingbird	<i>Archilochus colubris</i>
Eastern Wood-Pewee	<i>Contopus virens</i>
Savannah Sparrow	<i>Passerculus sandwichensis</i>
Semi-palmated Plover	<i>Charadrius semipalmatus</i>
Short-billed Dowitcher	<i>Limnodromus griseus</i>
Snow Bunting	<i>Plectrophenax nivalis</i>
Snow Goose	<i>Chen caerulescens</i>
Solitary Sandpiper	<i>Tringa solitaria</i>
Song Sparrow	<i>Melospiza melodia</i>
Sora	<i>Porzana carolina</i>
Spotted Sandpiper	<i>Actitis macularia</i>
Horned Grebe	<i>Podiceps auritus</i>
Eared Grebe	<i>Podiceps nigricollis</i>
Swainson's Hawk	<i>Buteo swainsoni</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Upland Sandpiper	<i>Bartramia longicauda</i>
Vesper Sparrow	<i>Poocetes gramineus</i>
Double-crested Cormorant	<i>Phalacrocorax auritus</i>
White-fronted goose	<i>Anser albifrons</i>
Wood Duck	<i>Aix sponsa</i>
Lesser Scaup	<i>Aythya affinis</i>
Source: Sibley, D.A. 2006. The Sibley Field Guide to Birds of the Eastern United States; North Dakota Game and Fish Department.	

Wildlife occurrence and habitat within a one-mile radius of the Site were inventoried on May 21, 2009 by John W. Schulz, Senior Biologist, via a walking survey and visual inspection with the aid of binoculars. Historical data for raptor species of concern in the area surrounding the Site was reviewed in conjunction with the on-Site survey (USEWS 2008).

During the field survey, 22 resident and migratory bird species were observed. These were black-capped chickadee (*Parus atricapilla*), house sparrow (*Passer domesticus*), sharp-tailed grouse (*Tympanuchus phasianellus*), prairie horned lark (*Eremophila alpestris*), American robin (*Turdus migratorius*), American tree sparrow (*Spizella arborea*), bank swallow (*Riparia riparia*), mountain bluebird (*Sialia currucoides*), killdeer (*Charadrius vociferous*), least flycatcher (*Empidonax minimus*), western meadowlark (*Sturnella neglecta*), yellow warbler (*Dendroica petechia*), Canada goose (*Branta canadensis*), mourning dove (*Zenaidura macroura*), turkey vulture (*Cathartes aura*), eastern wood-pewee (*Contopus virens*), savannah sparrow

(*Passerculus sandwichensis*), brown-headed cowbird (*Molothrus ater*), grasshopper sparrow (*Ammodramus saviannarum*), sharp-tailed grouse (*Tympanuchus phasianellus*), American goldfinch (*Phaethon dominica*) and western kingbird (*Tyrannus verticalis*).

At least twenty-one large and small mammals are present within McKenzie and Dunn Counties throughout the year (Table 3). The rolling mixed grass prairie and the woody cover in draws west and east of the Site likely provide food sources for many of these species. No mammals were observed during the field survey. A review of ND Game and Fish Department winter aerial survey data indicates that white-tailed deer density within McKenzie and Dunn Counties is excellent and suggests a healthy and stable-to-increasing deer population (Krue 1991). Several other big game and furbearer species potentially inhabit the vicinity of the Site.

Table 3. Mammal Species in McKenzie County

Common Name	Scientific Name
Pronghorn Antelope	<i>Antilocapra americana</i>
Badger	<i>Taxidea taxus</i>
Beaver	<i>Castor canadensis</i>
Big Brown Bat	<i>Eptesicus fuscus</i>
Coyote	<i>Canis latrans</i>
Eastern Chipmunk	<i>Tamias striatus</i>
Fox Squirrel	<i>Sciurus niger</i>
Franklin's Ground Squirrel	<i>Spermophilus franklini</i>
Little Brown Bat	<i>Myotis lucifugus</i>
Long-tailed Weasel	<i>Mustela frenata</i>
Meadow Vole	<i>Microtus pennsylvanicus</i>
Mink	<i>Mustela vison</i>
Muskrat	<i>Ondatra zibethicus</i>
Raccoon	<i>Procyon lotor</i>
Red Fox	<i>Vulpes vulpes</i>
Red Squirrel	<i>Tamiasciurus hudsonicus</i>
Silver-haired Bat	<i>Lasiurus noctivagus</i>
Thirteen-lined Ground Squirrel	<i>Spermophilus tridecemlineatus</i>
Mule Deer	<i>Odocoileus hemionus</i>
White-tailed Jackrabbit	<i>Lepus townsendii</i>

Source: Krue, J. 1991. Big Game in North Dakota: A Short History, North Dakota Game and Fish Department.

## Vegetation Survey

The Site was visually inspected by Sara Simmers, Botanist, for sensitive plants and their potential habitat via a general walking survey within a minimum ten acre radius including and surrounding the proposed well pad and a minimum 125 feet on either side of the proposed access route. A focused survey was used in areas of potential suitable habitat for sensitive plants. All observed plant species were recorded (Table 4). Nomenclature follows Great Plains Flora Association (1986).

### Overall Site Description

The Site was in northeast McKenzie County within one mile from Lake Sakakwea. The topography of the area was level to steeply rolling grassland interrupted with deep drainages. The vegetation of the Site and surrounding area included mixed grass prairie and woody draws (refer to Appendix II for photographs with further descriptions of habitat, aspect and topography). The major uses of the area were for rangeland and oil production.

### Access Route

The access route began on USFS-owned land to the south of the Site, closely following the route of an existing two-track road. The access road continued onto Corps-owned land in the northeast corner of Section 3, T153N, R96W, following the route of the existing two-track road for approximately 0.15 miles. In this portion of the route, the road crossed through a low valley/drainage between two steep ridges, one to the southwest and the other to the northeast (Appendix I, Figure 4). The route in this section had a gentle northwest slope. Crested wheatgrass (*Agropyron cristatum*) was dense in this low area, but was reduced to scattered clumps upslope. Snowberry (*Symphoricarpos occidentalis*) shrubs were the other dominant plant in this valley. Fringed sagewort (*Artemisia frigida*) and white sagewort (*Artemisia ludoviciana*) were common forbs. Other species present in the drainage included blue grama (*Boutelous gracilis*), American vetch (*Vicia americana*), bluebells (*Mertensia lanceolata*), and prairie wild rose (*Rosa arkansana*).

To the southwest of the access route on the northeast-facing slope, green needlegrass (*Stipa viridula*) and little bluestem (*Andropogon scoparius*) were dominant grasses. Clumps of creeping juniper (*Juniperus horizontalis*) were dominant on the steepest portions of the slope. Common juniper (*Juniperus communis*) was also present. Common forbs observed were pasqueflower (*Anemone patens*), stiff sunflower (*Helianthus rigida*), purple coneflower (*Echinacea angustifolia*), silver bladderpod (*Lesquerella ludoviciana*), and purple locoweed (*Oxytropis lamberti*).

The slope to the east-northeast of the route had more little bluestem (*Andropogon scoparius*), with smaller patches of creeping juniper (*Juniperus horizontalis*). Western wheatgrass (*Agropyron smithii*) and thread-leaved sedge (*Carex filifolia*) were subdominant graminoids. Forb composition was similar to that of the southwest slope, with the addition of wavy leaf thistle (*Cirsium undulatum*), wild parsley (*Marrubium divaricatum*), golden pea (*Thermopsis rhombifolia*), and pussy toes (*Antennaria parviflora*). Several shrubs were scattered

on the hillside, including: common juniper (*Juniperus communis*), fragrant sumac (*Rhus aromatica*), and buffaloberry (*Shepherdia argentea*).

A woody draw was west of the road running in a southeast-northwest direction (Appendix I, Figure 4). The dominant trees were green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americana*). Tall shrubs formed a dense middle layer, including the species chokecherry (*Prunus virginiana*) and Juneberry (*Amelanchier alnifolia*), which were in full bloom at the time of the survey. Snowberry (*Symphoricarpos occidentalis*) and Kentucky bluegrass (*Poa pratensis*) formed a dense understory layer. Other dominant species in the understory were the graminoids smooth brome (*Bromus inermis*) and Sprengel's sedge (*Carex sprengelii*) and the forbs starry false Solomon's seal (*Smilacina stellata*) and yarrow (*Achillea millefolium*). Several other species were noted in the understory, including northern bedstraw (*Galium boreale*), dandelion (*Taraxacum officinale*), maple-leaved goosefoot (*Chenopodium gigantospermum*), star thistle (*Centaurea* sp.), and tall white violet (*Viola canadensis*).

Past the draw, the road continued north on a gentle upslope. The dominant species was little bluestem (*Andropogon scoparius*). Leafy spurge (*Euphorbia esula*) and yellow sweetclover (*Melilotus officinalis*), two invasive species, were present here, along with the native forbs textile wild onion (*Allium textile*), rigid sunflower (*Helianthus rigidus*), and white sagewort (*Artemisia ludoviciana*). A patch of the invasive grass smooth brome (*Bromus inermis*) about fifteen feet in diameter was on a small ridge to the west of the road past the woody draw.

The road continued across a grassy slope up a small ridgetop with creeping juniper (*Juniperus horizontalis*), thread-leaved sedge (*Carex filifolia*), and green needlegrass (*Stipa viridula*) dominant. The most common forbs within this portion of the route were bastard toadflax (*Comandra umbellata*) and pasqueflower (*Anemone patens*). Several other native forbs were present, including rigid goldenrod (*Solidago goldenrod*), plains crophaca (*Astragalus gilaiflorus*), fringed sagewort (*Artemisia frigida*), blue flax (*Linum perenne*), ground plum (*Astragalus crassicaulis*), sneezewort aster (*Solidago ptarmicoides*), blue lettuce (*Lactuca oblongifolia*) and broom snakeweed (*Gutierrezia sarothrae*).

Past the crest of the small ridge, the route continued into a wide, shallow, gentle slope at the tip of another woody draw, which sloped steeply to the west of the route (Appendix I, Figure 4). The draw was dominated by chokecherry (*Prunus virginiana*), with a few silver sagebrush (*Artemisia cana*) shrubs scattered along the margin. Dominant species in and around the draw were crested wheatgrass (*Agropyron cristatum*), smooth brome (*Bromus inermis*), Kentucky bluegrass (*Poa pratensis*), snowberry (*Symphoricarpos occidentalis*) and white sagewort (*Artemisia ludoviciana*).

The road then went up a moderate south-facing grassy slope and turned to the right, marking the beginning of the new construction of the road, which will amount to approximately 0.16 miles. Boulders and scattered rocks were present on ridgetops and slopes in this area. There did not appear to be any recent grazing, but many old cowpies indicated grazing in the past. The grassland composition was similar to the grassland slopes previously described, with the addition of a few more forbs. Past this slope, the road reached the top of a nearly flat, wide ridgetop. It was plateau-like, with an overall gentle north-facing slope. Diversity of the



grassland on the ridgetop was low, and crested wheatgrass (*Agropyron cristatum*) was dominant. The road continued in a northeast direction, first going slightly downslope. In this area, other common species included fringed sagewort (*Artemisia frigida*), dandelion (*Taraxacum officinale*), and American vetch (*Vicia americana*). Less common species noted were prickly pear cactus (*Opuntia polyacantha*), blue lettuce (*Lactuca oblongifolia*), and several patches of snowberry (*Symphoricarpos occidentalis*). In some areas western wheatgrass (*Agropyron smithii*) and prairie Junegrass (*Koeleria pyramidata*) increased in abundance, but overall crested wheatgrass dominated the stand.

Continuing in the northeast direction, the road went upslope just as it reached the proposed well pad location on the southeast corner/edge of the pad. The tip of a woody draw running from northwest to southeast was near the access road at this point (Appendix II, Photo 2). The composition of this area was predominantly of native species, though some crested wheatgrass (*Agropyron cristatum*) was also present. Species noted on the margins of the woody draw included green needlegrass (*Stipa viridula*), prairie rose (*Rosa arkansana*), fringed sage (*Artemisia frigida*), and yarrow (*Achillea millefolium*). Further into the draw chokecherry (*Prunus virginiana*), buffaloberry (*Shepherdia argentea*), and green ash (*Fraxinus pennsylvanica*) became dominant in the overstory. Numerous forbs were in the understory, including Sprengel's sedge (*Carex sprengelii*), white sagewort (*Artemisia ludoviciana*), northern bedstraw (*Galium boreale*), rigid goldenrod (*Solidago rigida*), smooth blue aster (*Aster laevis*), and wild bergamot (*Monarda fistulosa*). The grasses Kentucky bluegrass (*Poa pratensis*) and big bluestem (*Andropogon gerardii*) were also observed.

#### Well Pad

The well pad was on a flat plateau-like area at the top of a ridge, with slightly rolling topography in some areas (Appendix II, Photo 1). The south edge was on the highest part of the ridge, which sloped slightly to the north overall toward the center stakes of the two wells (Appendix II, Photo 4). On the north half of the well pad, the pad slopes to the northeast in the northeast corner and to the northwest in the northwest corner, both toward the tops of woody draws (Appendix I, Figure 4).

The well pad was open grassland which extended past the well pad in all directions in the surrounding area (Appendix II, Photos 5-8). The composition was a mix of native and non-native areas, with the non-native areas comprising the majority (about 75%) of the area. The non-native patches contained crested wheatgrass (*Agropyron cristatum*) and Kentucky bluegrass (*Poa pratensis*) throughout, with crested wheatgrass dense and dominant. Other species in these areas included dandelion (*Taraxacum officinale*), fringed sagewort (*Artemisia frigida*), rockcress (*Arabis* sp.), and aromatic aster (*Aster oblongifolius*). Numerous patches of dense smooth brome (*Bromus inermis*), ranging from 10-20 feet in diameter, were present throughout all of the proposed well pad area and beyond the boundaries. In the southeast corner of the well pad was a patch of snowberry (*Symphoricarpos occidentalis*) with a dense understory of Kentucky bluegrass (*Poa pratensis*).

In some portions of the well pad, native species were more dominant. The graminoids western wheatgrass (*Agropyron smithii*), green needlegrass (*Stipa viridula*), thread-leaved sedge

(*Carex filifolia*), needle-and-thread (*Stipa comata*), and prairie Junegrass (*Koeleria pyramidata*) were main components of these areas. Fringed sagewort (*Artemisia frigida*), dandelion (*Taraxacum officinale*), prickly pear cactus (*Opuntia polyacantha*), and wavy-leaf thistle (*Cirsium undulatum*) were some of the common forbs noted in these more native areas.

A moderately wide draw began off the northeast corner of the well pad (Appendix II, Photo 3). The overstory of green ash (*Fraxinus pennsylvanica*) chokecherry (*Prunus virginiana*), and buffaloberry (*Shepherdia argentea*) was a fairly open canopy. Smooth brome (*Bromus inermis*) was dominant in the understory and scattered around the margins with crested wheatgrass, Kentucky bluegrass, and snowberry. Some scattered silver sagebrush (*Artemisia cana*) was also present. Similar understory forbs were notable: wild bergamot (*Monarda fistulosa*), American vetch (*Vicia americana*), northern bedstraw (*Galium boreale*), sturry false Solomon's seal (*Silulacina stellata*), and white sagewort (*Artemisia ludoviciana*).

Another very similar draw began off the corner of the northwest corner of the well pad. The species composition was similar except that needleleaf sedge (*Carex* cf. *eleocharis*) was present on the slopes along the margin of the woodland. There was more smooth brome (*Bromus inermis*) along the margins and in the understory of the woodland, and the surrounding grassland to the northwest of the well pad was dense with this species. In addition, Juneberry (*Amelanchier alnifolia*) shrubs were present.

Table 4. Observed Plant Species within Project Area

Species*	Common Name
<i>Achillea millefolium</i> L.	yarrow
<i>Agropyron cristatum</i> (L.) Gaertn.	crested wheatgrass
<i>Agropyron smithii</i> Rydb.	western wheatgrass
<i>Allium textile</i> A. Nels & Macbr.	textile wild onion
<i>Amelanchier alnifolia</i> Nutt.	Saskatoon serviceberry
<i>Andropogon gerardi</i> Vitman	big bluestem
<i>Andropogon scoparius</i> Michx.	little bluestem
<i>Anemone cylindrica</i> A. Gray	Canada anemone
<i>Anemone patens</i> L.	pasque flower
<i>Antennaria parviflora</i> Nutt.	pussy-toes
<i>Arabis glabra</i> (L.) Benth.	tower mustard
<i>Artemisia cana</i> Pursh	silver sagebrush
<i>Artemisia cf. campestris</i> L. subsp. <i>undulata</i> (Michx.) Hall & Cress.	western sagewort
<i>Artemisia frigida</i> Willd.	fringed sage
<i>Artemisia ludoviciana</i> Nutt.	white sage
<i>Aster laevis</i> L.	smooth blue aster
<i>Aster oblongifolius</i> Nutt.	aromatic aster
<i>Astragalus craticarpus</i> Nutt.	ground-plum
<i>Astragalus glycyphorus</i> Sheld.	plains orophaca
<i>Bouteloua gracilis</i> (H.B.K.) Lag. ex. Griffiths	blue grama
<i>Bromus inermis</i> Leyss.	smooth brome
<i>Carex cf. eleocharis</i> Bailey	needleleaf sedge
<i>Carex filifolia</i> Nutt.	threadleaf sedge
<i>Carex sprungii</i> Dew. ex Spreng.	Sprung's sedge
cf. <i>Centaurea iberica</i> Trev. ex Spreng.	Iberian star-thistle
<i>Carolinella lanata</i> (Pursh) Howell	winterfat
<i>Chenopodium giganteum</i> Adlam	maple-leaved goosefoot



<i>Cirsium undulatum</i> (Nutt.) Spring	wavy-leaf thistle
<i>Comandra umbellata</i> (L.) Nutt.	bastard toadflax
<i>Echinacea angustifolia</i> DC.	purple coneflower
<i>Euphorbia corollata</i> L.	leafy spurge
<i>Fraxinus pennsylvanica</i> Marsh.	green ash
<i>Gallium boreale</i> L.	northern bedstraw
<i>Oxalis stricta</i> (Pursh) Britt. & Rusby	brown snake-weed
<i>Hedysarum boreale</i> Nutt.	sweet-broom
<i>Heliopsis rigida</i> (Cass.) Desf.	stiff sunflower
<i>Juniperus communis</i> L.	common juniper
<i>Juniperus horizontalis</i> Moench.	creeping juniper
<i>Koeleria pyramidata</i> (Lam.) Beauv.	Junegrass
<i>Lactuca oblongifolia</i> Nutt.	blue lettuce
<i>Lesquerella cf. ludoviciana</i> (Nutt.) S. Wats.	silver bladderpod
<i>Linum perenne</i> L. var. <i>lewisii</i> (Pursh) Eat. & Wright	blue flax
<i>Melilotus officinalis</i> (L.) Pall.	yellow sweet clover
<i>Mertensia lanceolata</i> (Pursh) A. DC.	bluebells
<i>Monarda fistulosa</i> L.	wild bergamot
<i>Mutinus divaricatus</i> (Pursh) Nutt.	wild pansley
<i>Opuntia polyacantha</i> Haw.	plains prickly pear
<i>Oxytropis lamberti</i> Pursh.	purple locoweed
<i>Poa pratensis</i> L.	<b>Kentucky bluegrass</b>
<i>Prunus virginiana</i> L.	chokacherry
<i>Rhus aromatica</i> Ait.	fragrant sumac
<i>Ribes corymbosum</i> L.	northern gooseberry
<i>Rosa arkansana</i> Porter	prairie wildrose
<i>Shepherdia argentea</i> (Pursh) Nutt.	buffaloberry
<i>Sesilactis stellata</i> (L.) Desf.	starry false Solomon's seal
<i>Solidago ptarmicoides</i> (Ness) Boivin	snow-on-the-stem
<i>Solidago rigida</i> L.	rigid goldenrod
<i>Stipa comata</i> Trin. & Rupr.	needle and thread
<i>Stipa viridula</i> Trin.	green needlegrass
<i>Symphoricarpos occidentalis</i> L.	western snowberry
<i>Taraxacum officinale</i> Weber	common dandelion
<i>Thermopsis rhombifolia</i> Nutt. ex Richards	prairie buck bean
<i>Tragopogon dubius</i> Scop.	goat's beard
<i>Ulmus americana</i> L.	American elm
<i>Vicia americana</i> Mill. ex Willd.	American vetch
<i>Violeta canadensis</i> L.	tall white violet

\* Nomenclature follows Great Plains Flora Association, 1986. Flora of the Great Plains. University Press of Kansas, Lawrence, KS.

**Excluded:** exotic species

## Appendix J

### **Draft** Biological Assessment for Pittsburgh Federal 2H and 3H

**Pittsburg Federal 2H and 3H Oil Wells  
Well Pad and Access Road **DRAFT** Biological Assessment  
U.S. Army Corps of Engineers, Garrison Project Office, Omaha District**

**LOCATION:**

McKenzie County, North Dakota  
T153N, R96W, S3 NW/NE  
Tobacco Garden Bay, ND (48103-A1-TF-024)

Contact Person:

Dawn Martin, Project Manager  
Kleinfelder/Buys and Associates  
(Contractor to the U.S. Army Corps of Engineers and  
Newfield Exploration Company)  
300 East Mineral Ave, Suite 10  
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**Introduction**

The purpose of this biological assessment is to review the proposed drilling of two exploratory oil wells from one well pad (Pittsburg Federal 153-96-3-2H and Pittsburgh Federal 153-96-3-3H) in sufficient detail to determine to what extent the proposed action may affect any of the threatened, endangered, proposed, or sensitive (TES) species listed below. This biological assessment is prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (16 U.S.C. 1536 (c)), and follows the National Environmental Policy Act (NEPA) of 1969, as amended, the Council on Environmental Quality's (CEQ) regulations for implementing NEPA (40 CFR 1500-1508), the U.S. Army Corps of Engineers' (hereinafter referred to as the Corps or USACE) regulations for implementing NEPA (ER 200-2-2), and other applicable environmental regulations.

The proposed wells and associated access road would be located in the NW ¼ of the NE ¼ of Section 3, T153N, R96W (action area) in McKenzie County, North Dakota (**Figure 1**). The species considered in this document are:

**Endangered Species**

Gray wolf (*Canis lupus*)  
Whooping crane (*Grus americana*)  
Black-footed ferret (*Mustela nigripes*)  
Interior least tern (*Sterna antillarum*)  
Pallid sturgeon (*Scaphirhynchus albus*)

**Threatened Species**

Piping plover (*Charadrius melodus*)

### **Proposed/Candidate Species**

Dakota skipper (*Hesperia dacotae*)  
Greater sage grouse (*Centrocercus urophasianus*)  
Sprague's pipit (*Anthus spragueii*)

### **Monitored Species**

Bald eagle (*Haliaeetus leucocephalus*)  
Golden eagle (*Aquila chrysaetos*)

### **Critical Habitat**

There is no designated critical habitat for TES species on the proposed Pittsburgh Federal 2H and 3H well pad or access road. However, the U.S. Fish and Wildlife Service (USFWS) recovery plan (USFWS 2002a) for the piping plover indicates that critical habitat is found along Lake Sakakawea (**Figure 2**), which is located 0.5 miles north of the project area. Piping plover critical habitat found along Lake Sakakawea includes:

- Shallow, seasonally to permanently-flooded alkali lakes or wetlands,
- Springs and fens along the edges of alkali lakes or wetlands,
- Uplands within 200 feet of alkali lakes or wetlands,
- Sparsely vegetated areas associated with the Missouri River, and
- Sparsely vegetated areas associated with Lake Sakakawea and Lake Oahe.

### **Consultation to Date**

On January 13, 2011, the Corps held a kickoff meeting for the Pittsburgh Federal 2H and 3H project. Participants included:

Mike Morris - USACE, NRS  
Hattie Payne - USACE, NRS  
Charles Sorenson - USACE, NRS/Realty Specialist  
Heather Hundt - USACE, Environmental Compliance Coordinator  
Tim Kolke - USACE, Lead Realty Specialist  
Jeff Towner - USFWS, Field Supervisor Ecological Services  
Eric Sundberg - Newfield  
Candice Twitty - Newfield  
Chrissy Lawson - Kleinfelder/Buys and Associates  
Dawn Martin (via teleconference) - Kleinfelder/Buys and Associates

During the meeting, Jeff Towner provided input on the TES species of concern for this project, contact information for the USFWS primary point of contact for this project (Heidi Riddle), and preliminary thoughts on issues of concern related to the proposed exploratory drilling project. Informal Section 7 Consultation with the USFWS will be requested through the submittal of this biological assessment to the USFWS.

### **Current Management Direction**

Lake Sakakawea, formed by the Garrison Dam on the Missouri River in west-central North Dakota, along with the adjacent shoreline, is under the stewardship of the U.S. Army Corps of Engineers (Corps), Garrison Project Office (GPO), Omaha District. The proposed location for the Pittsburgh Federal 2H and 3H well pad and access road occurs within lands owned and administered by the GPO. This area falls under Corps jurisdiction and surface ownership because of its proximity to Lake Sakakawea. The GPO is authorized for the purposes of flood control, hydroelectric power generation, recreation, water supply, fish and wildlife enhancement, and navigation. The Corps manages its lands for long-term public access to, and use of, natural resources in cooperation with other Federal, State, and local agencies as well as the private sector. The Civil works mission of the Corps includes the protection, restoration, and management of the natural environment. Furthermore, the Corps must ensure that activities on Corps lands are done in an environmentally sustainable, economic, and technically sound manner and follow all laws and regulations at all government levels (USACE 2007).

Current management directions or strategies for the Federally-listed species analyzed in this biological assessment are outlined in various documents including USFWS recovery plans. Recovery plans delineate reasonable actions that are believed to be required to recover and/or protect the identified species. Plans are prepared by the USFWS, sometimes with the assistance of recovery teams, contractors, State agencies, or other organizations. These documents generally identify population recovery criteria in order to downlist or delist the species. The following Recovery Plans exist for species addressed in this biological assessment:

- Recovery Plan for the Eastern Timber Wolf revised, 01/31/1992
- Black-footed Ferret Recovery Plan, 08/08/1988
- Great Lakes and Northern Great Plains Piping Plover, 05/12/1988
- Whooping Crane Recovery Plan – Final Third Revision, 05/29/2007
- Least Tern Recovery Plan, 09/19/1990
- Pallid Sturgeon Recovery Plan, 11/07/1993

Section 7(a) of the ESA requires Federal agencies to evaluate their actions with respect to any species that are proposed or listed as endangered or threatened, and their critical habitat, if any has been formally designated. Regulations implementing this interagency cooperation provision of the ESA are codified at 50 Federal Register (FR) 402. Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to “adversely affect” or “jeopardize the continued existence” of a Federally-listed species or result in the adverse modification or destruction of its critical habitat. If a Federal action “is likely to adversely affect” a Federally-listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the USFWS. Candidate species for listing under the ESA and the Corps sensitive species are also managed to prevent future listing as threatened or endangered. As lead agency for this Federal action, the Corps has the responsibility to comply with the ESA.

### **Description of the Applicant’s Proposal**

Newfield is proposing to drill two exploratory oil and gas wells from one well pad located on Corps-owned and administered land in McKenzie County, North Dakota. The well names and legal location for the well pad are outlined in **Table 1**. All construction activities would follow lease stipulations, the Application for Permit to Drill (APD), and guidelines and standards identified in the Surface Operating Standards for Oil and Gas Exploration and Development, 4th edition, also known as the “Gold Book” (BLM/USFS 2007). All lease operations would be conducted in full compliance with applicable laws and regulations, including 43 CFR 3100, Onshore Oil and Gas Orders 1, 2, 6 and 7, approved plans of operations and any applicable Notices to Lessees.

**Table 1. Proposed Exploratory Well Names and Locations**

Well Name	Spot Call (¼ ¼) Surface Location	Section	Township	Range	Surface Hole Latitude	Surface Hole Longitude
Pittsburgh Federal 153-96-3-2H	NWNE	3	153N	96W	48°06'36.26" N	103°00'32.29" W
Pittsburgh Federal 153-96-3-3H	NWNE	3	153N	96W	48°06'36.26" N	103°00'33.40" W

**Field Camps**

Long-term residential camps are not proposed. Self-contained trailers may house a few key personnel during drilling and completion operations, but such arrangements would be minimal. Construction and drilling personnel would typically commute to the project site. All debris and waste materials would be contained in a portable dumpster or trash cage. Upon completion of operations or as needed, the accumulated debris and waste materials would be removed from the site and disposed of at a State-approved waste disposal site. Sewage waste would be collected in portable chemical toilets, temporarily contained in either double-walled holding tanks or within a secondary containment system capable of holding 110 percent of the waste tank capacity. Toilet holding tanks would be regularly pumped and the contents transported to a State-approved wastewater treatment facility in accordance with applicable rules and regulations regarding sewage treatment and disposal. No burning of trash would be allowed.

**Proposed Access Road**

The primary access route to the action area would be from Highway 23 exiting at Keene, North Dakota. Directions to the action area are as follows:

- From Keene, North Dakota, travel in a northerly direction for approximately 12.3 miles to McKenzie County Road 2 (NFSR 869).
- Turn westerly for 5.0 miles to the existing XTO White Federal 34X-34 access road.
- Turn right to travel in a northerly direction for 0.8 miles to the proposed location.

Approximately 208 feet (0.04 miles) of new access/lease road would be constructed to access the new well pad. The road would be constructed within a 40-foot-wide corridor, with a final running surface of up to 16 feet. The total initial disturbance area on Corps land for the proposed access road would be 0.19 acres, with a total residual disturbance area of 0.08 acres after interim reclamation is conducted. The existing XTO White Federal 34X-34 access road would be used to minimize new surface disturbance and upgrades to those roads would occur on an as-needed basis to facilitate access to each drilling location. The travel corridor of this road would be maintained in good repair during all drilling, completion, and production operations. However, none of the existing road leading up to the proposed access road would be upgraded or improved.

The access road would be built or upgraded to accommodate drilling and completion vehicles/equipment in a safe manner. Design, construction, and maintenance would follow the standards outlined in the Gold Book (BLM/USFS 2007) and the Corps' Conditions of Approval (COAs). The proposed access road route spurs off of an existing two-track road and follows natural topographic contours. A maximum grade of 10 percent would be maintained and any additional drainage structures, where necessary, would be incorporated to prevent soil erosion and accommodate all-weather traffic. The proposed access road will be graveled with a minimum of six inches of 2-inch minus pit run gravel or crushed gravel prior to bringing production equipment onto the location. The addition of gravel to the new road would be minimized so that reclamation would be simplified should the well prove unproductive. All construction



materials would be obtained from approved, private sources off Corps lands, and would be certified weed-free. No materials would be removed from Corps lands without prior approval.

No approaches would be constructed along the access road. No vehicle traffic would be allowed off the established access road. In general, vehicle traffic would be minimized to the extent possible through strategic planning of operations activities. Fresh water would be used as needed to suppress and control dust.

Access road construction would typically require a D6 or larger crawler tractor, a D12 or larger motor grader, a Class 12R or larger track hoe, a mid-sized backhoe, two to four 10-yard dump trucks, and possibly a Class 988 loader. The road would be constructed using a crawler tractor or trackhoe to windrow the vegetation to one side, remove topsoil to the opposing side, and rough in the roadway. This would be followed by a grader or bulldozer to establish borrow ditches and crown the road surface.

All construction equipment would be either pressure-washed or air-blasted prior to moving onto and off of Corps lands.

### **Well Pad**

Under the Applicant's Proposal, a new well pad would be constructed. The proposed location for the well pad is illustrated in **Figure 1** and the attached plat diagrams. Construction of the well pad would involve the use of heavy equipment, such as a crawler tractor, motor grader, track hoe, backhoe, dump truck, and possibly a loader. As previously stated, all construction equipment would be either pressure-washed or air-blasted prior to moving onto Corps-owned and administered lands. All construction materials would be obtained from approved, private sources off Corps lands, and would be certified weed-free. The well pad would take five to seven days to construct.

With associated cut and fill slopes, berms and soil storage areas, the proposed well pad would occupy about 5.62 acres. The well pad would be constructed from the native sand/soil/rock materials and leveled by balancing cut and fill areas with the finished well pad, lined, and would be graded to ensure positive water drainage away from the site. In addition, general erosion control and prevention techniques that would be utilized as needed for the well pad include: cut slopes of  $\frac{3}{4}$ :1 to 2:1 horizontal to vertical ratio; fill slopes with 1  $\frac{1}{2}$ :1 to 2:1 horizontal to vertical ratio; compaction of fill slopes to minimize subsidence or slope failure; directing runoff away from cut and fill slopes using berms, diversion ditches, or waterbars; mulching exposed soils; use of physical and biotechnical slope stabilization and sediment control structures; and prompt revegetation (BLM/USFS 2007).

All drilling operations would use a closed loop mud and fluid system. Therefore, a reserve pit would not be necessary for the drilling of the proposed wells. Prior to the placement of the drill rig on the well pad, the entire location would be fenced in order to protect both wildlife and livestock. A cattle guard would be installed where the fence crosses the proposed access road. Fencing would be installed according to the Gold Book standards (BLM/USFS 2007) and the Corps' COAs. The integrity of the fence would be maintained for the life of the project.

### **Drilling, Casing and Cementing**

Drilling operations would require about 25 days to reach the target depth. For the first 1,400 feet of hole drilled, a fresh-water based mud system with no additives would be used to minimize contaminant concerns for surrounding groundwater aquifers. Water would be obtained from a commercial source for this drilling stage, using a total of about 10,000 barrels (420,000 gallons) per well. Surface casing would be set to 1,321 feet and cemented back to the surface during drilling per North Dakota Industrial Commission (NDIC) rules. This depth is 50 feet below the base of the Fox Hills Formation, also per

NDIC rules, isolating all near surface freshwater aquifers in the action area. (NDIC §43-02-03-21)

After setting and cementing the surface casing, an oil-based mud (OBM) system (about 80 percent diesel fuel and 20 percent salt water) would be used to drill the remainder of the vertical hole and salt water would be used to drill the horizontal hole. About 60,480 gallons of diesel fuel and 15,120 gallons of salt water would be used for these stages. The intermediate casing would also be cemented from the target Bakken Formation at 10,434 feet depth at the end of the vertical/horizontal curve, through the curve, and up to 3,637 feet depth for both the Pittsburgh Federal #153-96-3-2H and the Pittsburgh Federal #153-96-3-3H. Drilling fluids would be contained in steel tanks placed on plastic/vinyl liners, then collected during drilling by centrifuging returns to separate the cuttings from fluids, a process that retrieves over 95 percent of the drilling fluids. These fluids would be recycled back into the steel tanks for continual re-use during the drilling process. Upon completion of drilling operations at each location, oil-based fluids would be collected to the extent possible (usually over 95 percent) for use elsewhere. All non-recyclable fluids, including fresh water, and cuttings generated would be hauled off-site and disposed of at a State-approved facility.

### **Completion and Evaluation**

After the wells have been drilled and cased, a completion (work-over) unit would be moved onto the site. For wells of the depth proposed, approximately 14 to 28 days are usually needed to clean out the well bore, pressure test the casing, perforate and fracture the horizontal portion of the hole, and run production tubing for commercial production. The typical procedure for fracturing is to pump downhole a mixture of sand and a transport medium (e.g., water and/or nitrogen) under extreme pressure. After fracturing, the well is typically flowed back to the surface to recover fracture fluids and remove excess sand. Fluids utilized in the completion procedure would be captured in tanks and disposed of at a State-approved facility.

### **Commercial Production**

If commercial production is supported from either of the proposed wells, additional equipment would be installed, including a pumping unit at the well head, a vertical heater/treater, and oil and produced storage water tanks. These facilities would be located as close as possible to each other to allow the maximum amount of interim reclamation of the well pad. Tanks would be placed on the cut portion of the well pad, and have a secondary containment sized to hold a minimum of 110 percent of the volume of the largest tank. Well site equipment will be electrically driven, unless an electric power source is unavailable. If an electric power source is unavailable, well site equipment would be powered by natural gas. All production facilities and equipment would have proper hatches, seals, and valves and would be inspected and maintained on a regular schedule. Any open vessels on-site would be enclosed with wire mesh or netting. All permanent above ground production facilities will be painted using an approved Corps paint scheme.

Produced oil would be collected in tanks installed on location and periodically trucked to an existing oil terminal until a connection to an existing pipeline is approved and installed. Any produced water would be captured in tanks and periodically trucked to an approved disposal site. The frequency of trucking activities for both oil and produced water would depend upon volumes and rates of production. The proposed wells are also expected to produce some natural gas. All natural gas would temporarily be flared until a pipeline is installed according to applicable NDIC regulations to gather and transport the gas product. This pipeline would parallel the proposed access road and tie into an existing Bear Paw Energy pipeline located at the existing road intersection.

The duration of production operations cannot be reliably predicted, but generally the average life of a productive well in this area is five to twenty years.

### **Electrical Service**

All electrical services related to the production phase of the wells would be buried along the route of the proposed access road. The use of a diesel-powered generator to provide electrical service at any time would not be allowed.

### **Reclamation**

Construction of the well pad, access road, and pipeline/utility corridor would initially disturb a total of about 5.95 acres. Interim reclamation measures to be accomplished within the first year following drilling and completion of both wells include reduction of the cut and fill slopes, redistribution of stockpiled topsoil, mulching exposed soils, and reseeding of disturbed areas. Interim reclamation would reduce the total amount of disturbance to approximately 3.72 acres of long-term disturbance. The unused area of the well pad and pipeline/utility corridor would be re-contoured, covered with top soil, and reseeded/mulched. Rat and mouse holes would be filled and compacted from bottom to top immediately following the release of the drilling rig. Assuming interim reclamation success, long-term surface disturbance of the well pad would be reduced to approximately 3.57 acres, and the long-term surface disturbance of the pipeline/utility corridor would be reduced to approximately 0.07 acres. The access road would be covered with stockpiled topsoil from the road running surface to the edge of cuts and fills and reseeded/mulched to reduce the long-term access-related disturbance to approximately 16 feet wide and about 0.8 acres in size. Erosion control measures would be installed as necessary.

Final reclamation would occur either in the short term if the proposed wells are commercially unproductive, or later upon final abandonment of commercial operations. All disturbed areas would be reclaimed. All facilities would be removed, well bores would be plugged with cement and dry hole markers would be set. Access roads and the well pad would be leveled or backfilled as necessary, re-contoured to approximate original contours, evenly spread with stored topsoil, scarified, and reseeded/mulched.

For both interim and final reclamation, seeding of Corps-approved seed mixtures and/or mulched with a certified weed-free mulch would be done during the next available season. If disturbance is done in fall, it would not be reseeded/mulched in the same calendar year. Seeding tags would be provided to the Corps for verification. Seed mixtures would consist of native species only. All construction equipment would be either pressure-washed or air-blasted prior to moving onto Corps lands. All reclamation materials would be obtained from approved, private sources off Corps lands, and would be certified weed-free.

Pending project approval, Newfield intends to drill the Pittsburgh Federal 2H and 3H wells during the late summer or early fall of 2011.

### **Applicant-Committed Environmental Protection Measures**

In addition to the environmental protection measures required by applicable regulatory authorities, the following applicant-committed environmental mitigation measures would be applied to all activities on Federal lands within the project area. Implementation of these measures would be incorporated as Conditions of Approval (COAs), which authorizes the Corps to enforce these measures to help avoid or minimize impacts to the environment.

#### **Agricultural / Rangeland Management**

- Newfield would repair or replace to current Corps standards any fences, cattle guards, gates, drift fences, and natural barriers that are damaged as a result of their proposed oil exploration.

### Air Quality

- Newfield would use water or other approved dust suppressants at the well pad and along roads, as determined appropriate by the Corps.
- Newfield would not allow any open burning of garbage or refuse at the well site.

### Cultural/Historical Resources

- Before construction begins Newfield personnel would inform Newfield employees, contractors and subcontractors about relevant Federal regulations intended to protect archaeological and cultural resources. This orientation would include training on cultural resource management. All personnel would be informed that collecting artifacts is a violation of Federal law and that employees engaged in this activity would be subject to disciplinary action. If cultural resource law violations are discovered, the offending employee would be subject to disciplinary action by Newfield and the violations would be reported to the appropriate Federal and State agencies, which may pursue prosecution.
- If cultural resources are uncovered during surface-disturbing activities, Newfield would suspend operations at the site and immediately contact the Corps, who would arrange for a determination of eligibility in consultation with the State Historic Preservation Office (SHPO), and, if necessary, recommend a recovery or avoidance plan.

### Health and Safety/Hazardous Materials

- Newfield would utilize portable sanitation facilities at the drill site, place dumpsters and/or trash cages at the site to collect and store garbage and refuse, and ensure that all refuse and garbage is transported to licensed waste disposal sites.

### Migratory Birds and Raptors

- In accordance with the United States Forest Service (USFS) Dakota Prairie Grassland's Land and Resource Management Plan (2001), the following measures would be implemented to further minimize potential impacts to migratory birds/raptors:
- Prior to any surface-disturbing activities between February 1 and July 15, a Corps approved contractor would survey all areas within 0.5 mile of proposed surface disturbance for the presence of raptor nests. If active raptor nests are found, construction would not occur during the nesting season for that species within the species-specific buffer.
- Construction would be scheduled after July 15 to avoid the breeding and nesting season of migratory birds and other wildlife.
- Half-mile buffers would be maintained between the project location and any active golden and bald eagle nests.
- If whooping cranes are sighted within one mile of the project area, Newfield would suspend operations at the site and immediately contact the Corps, who would consult with the USFWS. All work would cease within the project area until the whooping cranes leave the area.

### Paleontological Resources

- If fossils are encountered during excavation, construction would be suspended, and the Corps would be notified. Construction would not resume until the fossils are assessed by the Corps, and appropriate mitigation measures are developed and implemented.

### Soils

- During construction activities, topsoil would be temporarily stockpiled and either seeded/mulched or covered with a breathable material within 10 days after ground removal to reduce erosion until

interim reclamation is initiated. On reclaimed areas, topsoil depths would be distributed evenly unless conditions warrant a varying depth.

- Areas used for spoil storage would be stripped of topsoil before spoil placement.
- Appropriate erosion control and revegetation measures would be employed as needed. In addition, general erosion control and prevention techniques that would be utilized as needed for the well pad include: cut slopes of  $\frac{3}{4}$ :1 to 2:1 horizontal to vertical ratio; fill slopes with 1  $\frac{1}{2}$ :1 to 2:1 horizontal to vertical ratio; compaction of fill slopes to minimize subsidence or slope failure; directing runoff away from cut and fill slopes using berms, diversion ditches, or waterbars; mulching exposed soils; use of physical and biotechnical slope stabilization and sediment control structures; and prompt revegetation (BLM 2007, USFS 2007). If any portion of the proposed well pad or access road includes areas with unstable soils where seeding/mulching alone may not adequately control erosion, grading would be used to minimize slopes, and water bars would be installed on disturbed slopes. Erosion control efforts would be monitored by Newfield and necessary modifications made to control erosion.
- Soils compacted during construction would be ripped and tilled as necessary prior to reseeding/mulching. Cut and fill sections on all disturbed areas would be revegetated with plant species approved by the Corps.
- If ground frost prevents the segregation and removal of the topsoil material from the less desirable subsoil material, cross ripping to the depth of the topsoil material would be implemented.

#### Vegetation

- Removal and disturbance of vegetation would be kept to a minimum through construction site management.

#### Visual Resources

- Tanks, separators, wellheads, and other associated pad facilities would be painted a non-reflective, earth tone color as determined by the Corps.

#### Water Resources

- Newfield would inform their employees, contractors and subcontractors of the potential impacts that could result from accidental spills, as well as the appropriate actions to take if a spill does occur.
- Newly constructed gas and water pipelines would be pressure tested to evaluate structural soundness and reduce the potential for leaks.
- Gas and water pipelines would be bored to avoid impacts to Corps jurisdictional drainages.

#### Wildlife

- To minimize wildlife-vehicle collisions, Newfield would advise employees and contractors regarding appropriate speed limits in the vicinity of the project area.
- Newfield employees and contractors would be educated about anti-poaching laws. If wildlife law violations are discovered, the offending employee would be subject to disciplinary action by Newfield and the violations would be reported to the appropriate Federal and State agencies, which may pursue prosecution.

#### **Conservation/Minimization Measures**

The Pittsburgh-Federal 2H and 3H project includes several design features in the Applicant's Proposal



and several Corps-required mitigation measures (see Alternatives 2 and 3 of the associated Environmental Assessment) that are intended to minimize potential effects on natural and biological resources, and thus would indirectly serve as conservation measures for TES species and potential habitats. Some of the inherent conservation measures are described below:

Newfield would drill two wells from one well pad, thereby minimizing the surface disturbance foot-print, which will reduce habitat loss and fragmentation and reduce the potential for noxious weed invasions.

During the growing season, pre- and post-construction noxious weed surveys would be conducted throughout the action area. Integrated weed management control measures would be completed in accordance with the United States Department of Agriculture (USDA) and the State of North Dakota's Century Code, Noxious Weed Control (Chapter 63-01.1). All construction equipment would be either pressure-washed or air-blasted prior to moving onto and off of Corps lands, thereby helping to prevent the introduction of weed seeds into the project area from project related vehicles and equipment. All construction materials would be obtained from approved, private sources off Corps lands, and certified weed-free.

General erosion and sedimentation control techniques that would be used for the well pad and access road include: cut slopes  $\frac{3}{4}$ :1 to 2:1 horizontal to vertical ratio; fill slopes with 1  $\frac{1}{2}$ :1 to 2:1 horizontal to vertical ratio; compaction of fill slopes to minimize subsidence or slope failure; directing runoff away from cut and fill slopes using berms, diversion ditches, or waterbars; mulching exposed soils; use of physical and biotechnical slope stabilization and sediment control structures; and prompt revegetation (BLM 2007). In addition, a catch trench would be constructed on the down slope end of the well pad to contain any water drainage from the site. All water retained in the catch trench would be pumped and removed from the site or left to evaporate. No pumping of water from the catch tank onto Corps lands would be allowed.

All drilling operations would use a closed loop mud and fluid system. Therefore, a reserve pit would not be necessary for the drilling of the proposed well. Prior to the placement of the drill rig on the well pad, the entire well pad location would be fenced in order to protect both wildlife and livestock. A cattle guard would be installed where the fence crosses the proposed access road. Fencing would be installed according to the Gold Book standards (BLM/USFS 2007) and Corps' COAs.

Drilling fluids would be contained in steel tanks placed on plastic/vinyl liners, then collected during drilling by centrifuging returns to separate the cuttings from fluids, a process that retrieves over 95 percent of the drilling fluids. These fluids would be recycled back into the steel tanks for continual re-use during the drilling process. Upon completion of drilling operations at each location, oil-based fluids would be collected to the extent possible (usually over 95 percent) for use elsewhere. All non-recyclable fluids, including fresh water, and cuttings generated would be hauled off-site and disposed of at a State-approved facility.

To reduce the potential for hydrocarbon contamination of soils, pipelines and associated collection piping would be designed to minimize the potential for spills and leaks. Storage tanks would be surrounded by berms capable of holding at least 110 percent of the largest single tank volume. Implementation of the project SPCC Plans would minimize the risk of such spills by providing safeguards against spills and detailing reporting and cleanup measures to be taken in the event of a spill.

To reduce the potential for impacts to migratory birds/raptors, Newfield would implement the following measures:



- 1) Construction, drilling, and completion activities will be scheduled after July 15 to avoid the typical breeding and nesting season (February 1 to July 15) of migratory birds and other wildlife;
- 2) Half-mile buffers would be maintained between project activities and any active golden and bald eagle nests;
- 3) At any time during construction, the USFWS would be notified of the presence of migratory birds / raptors or active nests on the well pad or access road construction location, and construction would be deferred until after July 15 or until such time as birds fledge the nest; and
- 4) The USFWS would be contacted if whooping cranes are sighted within one mile of the action area. All project-related work would cease within the action area until the whooping cranes leave the area.

### **Action Area**

The immediate action area (i.e., well pad and access road location) is located in northeastern McKenzie County, 0.5 miles south of Lake Sakakawea. The site topography consists of Missouri slope uplands intersected by deep, narrow drainages, which connect to Lake Sakakawea (**Figure 3**). Existing land uses consists of cattle grazing and oil and natural gas production on an adjacent well pad. The proposed well pad and access road location was field surveyed on August 8, 2010, by David Schmoller and Amy Schmoller (Schmoller, 2010). Their report documents vegetation types, wildlife habitats, and wildlife observations within the action area. Vegetation in the immediate action area is mostly mixed grass prairie. The proposed access road and well pad are situated on tableland that is composed of reclaimed grassland. Western wheatgrass (*Agropyron cristatum*) and smooth brome (*Bromus inermis*) are the dominant species. There are small patches of blue grama (*Bouteloua gracilis*), green needlegrass (*Stipa viridula*), needle-and-thread (*Stipa comata*) grassland associations and some western snowberry (*Symphoricarpos occidentalis*) (Schmoller 2010).

To the southwest and southeast of the proposed well site are two steep sided draws. One of these draws descends rapidly toward an unnamed, intermittent creek that empties into Lake Sakakawea, 0.6 mile to the north. The side slopes are dominated by little bluestem (*Andropogon scoparius*), prairie sandreed (*Calamovilfa longifolia*), cudweed sagewort (*Artemisia ludoviciana*), Canada anemone (*Anemone cylindrica*), dotted gayfeather (*Liatris punctata*), stiff sunflower (*Helianthus rigida*) and purple coneflower (*Echinacea angustifolia*). The ravines are dense wooded draws with green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), chokecherry (*Prunus virginiana*) habitat. The walls of the ravine are nearly continuous, unvegetated badland outcrops (Schmoller 2010).

Invasive species documented at the proposed well pad and access road include dandelion (*Taraxacum officinale*), salsify (*Tragopogon dubius*), blue lettuce (*Lactuca oblongifolia*) and yarrow (*Achillea millefolium*) (Schmoller 2011). Eight non-native species were also identified in the vicinity of the project area (Simmers 2009). One of these, leafy spurge (*Euphorbia esula*), is a State-listed noxious weed. Several other non-natives present within the project area are considered invasive species, meaning they spread aggressively and have negative impacts. These include crested wheatgrass, smooth brome grass, Kentucky bluegrass, and yellow sweet clover.

While the above description of vegetation is limited to that found in the immediate vicinity of the proposed well pad and access road (i.e., the immediate action area), because of the well pad and access road's proximity to Lake Sakakawea and wildlife habitats along its shore, for impact analysis purposes, the greater action area also includes a small portion of the lake shore given the potential for bird species to migrate through (over) the well pad and access road.

### **Species Accounts / Status of the Species in the Action Area**

Five Federally endangered, one threatened, two candidate, and two monitored species are listed by the USFWS for McKenzie County. The endangered species include the black-footed ferret (*Mustela*

*nigripes*), gray wolf (*Canis lupus*), interior least tern (*Sterna antillarum*), pallid sturgeon (*Scaphirhynchus albus*), and whooping crane (*Grus Americana*) (Schmoller 2010). The Federally threatened species includes the piping plover (*Charadrius melodus*). Candidate species include the Dakota skipper (*Hesperia dacotae*), and greater sage grouse (*Centrocercus urophasianus*). In addition, Sprague's pipit is currently undergoing a status review to determine if listing is warranted (Federal Register Vol. 74, No. 231, p. 63337), and there is also designated critical habitat for the piping plover within one mile of the action area (Schmoller 2010). The two monitored species include the bald eagle (*Haliaeetus leucocephalus*), and golden eagle (*Aquila chrysaetos*).

#### Black-footed Ferret

Black-footed ferrets have been extirpated from the state, but were historically found in the southwest corner of the state. The black-footed ferret depends on prairie dogs (*Cynomys* spp.) for their food and burrows for shelter. No prairie dog populations were observed in the action area (Schmoller 2010) and no black-footed ferrets have been reintroduced in this area.

#### Gray Wolf

Gray wolves are not known to breed in North Dakota, and most observation reports come from the extreme northeast part of the state (Simmer 2009). These animals most likely come from established populations in northern Minnesota and southern Manitoba (Schmoller 2010). The proposed project does not have forested cover or a suitable prey base for this species, and there have been no sightings in the vicinity of the action area (USFWS 2006, Schmoller 2010).

#### Interior Least Tern

Interior least tern breeding areas in North Dakota constitute about 192 km of the length of the Missouri River from Garrison Dam to the mouth of the Cannonball River south of Bismarck (USFWS 1990). While least tern habitat does not occur within the immediate vicinity of the well pad, they could migrate over the area to access habitats along Lake Sakakawea, which is 0.5 miles north of the proposed well pad.

#### Pallid Sturgeon

The pallid sturgeon is known to occur in the Missouri and Yellowstone Rivers. The Missouri River (Lake Sakakawea) is 0.5 miles north of the action area. The Yellowstone River is 45 miles to the southwest of the action area. Reproduction of pallid sturgeon in the Missouri and Yellowstone Rivers has not been documented in 33 years (Krentz 1997).

#### Whooping Cranes

Whooping cranes breed and nest in wetland habitat in Wood-Buffalo National Park, Canada. Migration through North Dakota occurs during the spring and fall. Potential roosting/foraging habitat does not occur in the immediate action area (i.e., does not occur at the well pad or access road) (Schmoller 2010). However, wetland roosting/foraging habitat does exist along the shore of Lake Sakakawea 0.5 miles north of the project location.

#### Piping Plover

The proposed well pad and access road occurs in an upland grassland habitat with no suitable nesting or foraging habitats for the piping plover. However, critical habitat for the species (alkali wetlands and lakes) occurs along the Missouri River (Lake Sakakawea), which is 0.5 miles north of the action area.

#### Dakota Skipper

Dakota skipper occurs in two types of habitat. The first is relatively flat and moist native bluestem prairie in which three species of wildflowers are usually present and in flower when Dakota skippers are in their adult (flight) stage- wood lily, harebell, and smooth camas (Schmoller 2010). The second habitat type is

upland prairie that is often on ridges and hillsides. Bluestem grasses and needle grasses dominate these habitats and three wildflowers are typically present in high quality sites that are suitable for Dakota skipper: pale purple and upright coneflowers and blanket flower (USFWS 2002b). The action area, in particular, the steep slopes to the southwest and southeast of the proposed well site, support potential habitat for the Dakota skipper.

#### Greater Sage Grouse

Greater sage grouse prefer big sagebrush (*Artemisia tridentate*) habitat, which does occur in McKenzie County. However, the closest population and known observations of greater sage grouse and known leks are located in the southwest corner of North Dakota, with the nearest territorial males observed in Billings County, which is 60 miles away. The bulk of greater sage grouse populations and known leks are in Bowman County, which is 130 miles away (Schmoller 2010). The species has not been documented in the action area.

#### Sprague's Pipit

Sprague's pipits are strongly tied to native prairie (land that has never been plowed) throughout their life cycle. It is one of the few bird species endemic to the North American prairie (Schmoller 2010). The breeding range includes all of North Dakota, except for the eastern most counties: northern and central Montana east of the Rocky Mountains, northern portions of South Dakota, and northwestern Minnesota (USFWS 2010). The action area is a mosaic of small patches of native mixed grass prairie along with reclaimed grasslands dominated by non-native species, and supports potential habitat for the species. The U.S. Forest Service has observed Sprague's pipits in the vicinity of the action area.

#### Bald and Golden Eagles

Bald and golden eagles prefer large trees with sturdy horizontal branches for nesting and winter roosting, with a clear flight path to water (Schmoller 2010). Wintering eagles concentrate at established roosting sites for the purpose of feeding and sheltering in close proximity to sufficient food sources. Such habitat does exist within the action area along the Missouri, which is 0.5 miles to the north of the proposed well pad. Large cottonwood (*Populus deltoides*), green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus Americana*) also occur in the wooded draws and creek bottoms adjacent to the well pad.

No bald eagles or bald eagle nest sites have been observed within the action area and there are no historical records of such (Schmoller 2010). However, because the action area provides suitable nesting and roosting habitat in the draws adjacent to the proposed well pad, and because of its proximity to habitats along the lake, bald eagles have the potential to migrate through or over the project location. The U.S. Forest Service Prairie Grasslands field office has a record of a golden eagle nest located approximately 1.5 miles southwest of the action area (Foli 2011).

#### **Effects**

Impact determinations for TES species and designated critical habitat within this biological assessment were based on the availability of habitat on or in the general vicinity of the action area.

#### Black-footed Ferret

Because prairie dog colonies do not occur in the action area, and black-footed ferrets have not been reintroduced in or near the action area, the project will have **no effect** on black-footed ferrets.

#### Gray Wolf

Because the action area does not have forested cover or a suitable prey base for this species, and there have been no sightings in the vicinity of the action area, gray wolves are not likely to occur near the Pittsburgh-Federal 2H and 3H action area, and the proposed project will have **no effect** on gray wolves.

### Interior Least Tern

While there are no suitable nesting/foraging habitats in the immediate action area (on the proposed well pad or access road), because least tern could migrate through/over the project location to and from the lake, individual birds could be temporarily affected by visual (i.e., human and equipment activity, night lighting) and noise (i.e., drill rigs, equipment, human presence) related disturbance during the construction, drilling, and completion stages of the project. Specifically, these visual and noise intrusions could cause individual birds to veer from or be displaced from typical migratory routes, and/or temporarily avoid nesting or foraging locations north of the well pad along the lake. Historical data for the past 16 years indicates that the nearest interior least tern nest is located more than one mile from the proposed project location. Based on Newfield's commitment to survey for interior least terns prior to construction activities occurring before August 15<sup>th</sup>, impose a one-mile buffer between project related activities and any active least tern nest, and cease construction, drilling or completion activity if nesting birds are documented within one mile of the well pad or access road, the project is not expected to affect breeding interior least terns. In addition, because construction, drilling, and completion are expected to occur after July 15 in the late summer/early fall of 2011, these potential effects could largely be avoided. However, because of the potential to temporarily affect individual least terns, the project may affect but **is not likely to adversely affect** the species.

### Pallid Sturgeon

As described under Conservation/Minimization Measures, the proposed action includes a suite of design features, such as earthen berms, intended to reduce the potential for petroleum spills or leaks, soil erosion, sediment yield, and stormwater events. Based on these measures and the distance of the well pad from pallid sturgeon habitat, the proposed project is not expected to affect water quality or quantity in Lake Sakakawea (Schmoller 2010). However, because of the location's proximity to the lake and the drainages that occur near the well pad, the proposed action may affect but **is not likely to adversely affect** pallid sturgeon.

### Whooping Crane

While there are no suitable wetland roosting or foraging habitats in the immediate action area (on the proposed well pad or access road), because whooping cranes could migrate through/over the project location to and from the lake, individual birds could be temporarily affected by visual (i.e., human and equipment activity, night lighting) and noise (i.e., drill rigs, equipment, human presence) related disturbance during the construction, drilling, and completion stages of the project. Specifically, these visual and noise intrusions could cause individual birds to veer from or be displaced from typical migratory routes, and/or temporarily avoid roosting or foraging locations north of the well pad along the lake. While Newfield has committed to cease construction, drilling, and completion activities if a whooping crane is observed in or near the project location, because of the potential to temporarily affect individual whooping cranes, the project may affect but **is not likely to adversely affect** the species.

### Piping Plover

While there are no suitable nesting/foraging habitats in the immediate action area (on the proposed well pad or access road), because piping plovers could migrate through/over the project location to and from the lake, individual birds could be temporarily affected by visual (i.e., human and equipment activity, night lighting) and noise (i.e., drill rigs, equipment, human presence) related disturbance during the construction, drilling, and completion stages of the project. Specifically, these visual and noise intrusions could cause individual birds to veer from or be displaced from typical migratory routes, and/or temporarily avoid nesting or foraging locations north of the well pad along the lake. Historical data for the past 16 years indicates that the nearest piping plover nest is located more than one mile from the

proposed project location. Based on Newfield's commitment to survey for piping plovers prior to construction activities occurring before August 15<sup>th</sup>, impose a one-mile buffer between project related activities and any active piping plover nest, and cease construction, drilling or completion activity if nesting birds are documented within one mile of the well pad or access road, the project is not expected to affect breeding piping plover. In addition, because construction, drilling, and completion are expected to occur after July 15 in the late summer/early fall of 2011, these potential effects could largely be avoided. However, because of the potential to temporarily affect individual piping plover, the project may affect but **is not likely to adversely affect** the species. Based on the distance of the proposed well pad and access road from critical habitat, and the conservation/minimization measures designed to reduce the potential for petroleum spills or leaks, soil erosion, sediment yield, and stormwater events, the project is not expected to result in the destruction or modification of critical habitat.

#### Dakota Skipper

The proposed project may displace individual butterflies and/or result in the loss of seasonal habitat due to construction of the proposed well pad and access road. However, because the primary habitat for the species is located in the steep draws to the southwest and southeast of the proposed well pad (not on the immediate well pad), the project **will not contribute to a trend toward Federal listing or cause a loss of viability of or jeopardize the species.**

#### Greater Sage Grouse

As greater sage grouse habitats and populations have not been documented in the project area, nor are they expected to occur in the action, the Pittsburgh-Federal 2H and 3H project will have **no effect** on the species.

#### Sprague's Pipit

Construction of the proposed well pad, access road, and pipeline/utility corridor will result in the loss of 5.95 acres potential habitat for Sprague's pipits. Based on Newfield's commitment to cease construction, drilling or completion activity if nesting birds are documented on the well pad or access road, the project is not expected to affect breeding Sprague's pipits. Therefore, the proposed project may affect individuals through loss of potential habitat, but **will not contribute to a trend toward Federal listing or cause a loss of viability of the species.**

#### Bald and Golden Eagles

If construction, drilling, or completion activities extend into the late fall or early winter increased human presence, traffic, and associated noise level could deter eagles from feeding or taking shelter in the action area.

Disruptive activities in the flight path between important roosting and foraging areas on the lake may also interfere with feeding. As no eagle roosting sites have been located within the action area, surface-disturbing activities under the Applicant's Proposal would not likely deter wintering eagles from utilizing or selecting roosting sites along the lakeshore. However, these activities could deter bald eagles from roosting within the steep draws adjacent to the well pad.

As previously stated, no bald eagle nests have been documented in the action area. One golden eagle nest was documented by the U.S. Forest Service approximately 1.5 miles southwest of the action area. This nest is out of the line of sight from the proposed well pad. In addition, based on Newfield's commitment to survey for raptors and impose a one-half mile buffer between project related activities and any active golden or bald eagle nest, the project is not likely to adversely affect nesting activity of either species.



Based on the information above, if construction, drilling and completion occurs during the late fall or early winter, the proposed project has the potential to affect individual eagles through temporary displacement from foraging or roosting habitats. However, the project is not likely to contribute to a trend toward re-listing of the bald eagle to the ESA, nor is it likely to adversely impact golden eagles.

### Cumulative Effects

The ESA defines cumulative effects (50 CFR 402.2) as the additive effects of future State, Tribal and private actions that are reasonably certain to occur in the action area. Future State, Tribal, and private land actions that are reasonably foreseeable in the Pittsburgh-Federal 2H and 3H action area include hunting, fishing, and boating (on the lake), livestock grazing, and oil and gas exploration and production. The primary cumulative effect concerns for these reasonably foreseeable future actions includes the introduction of invasive species, loss of native plant and wildlife habitats, and displacement of wildlife from habitats.

The spread of invasive and noxious weeds is a concern in areas proposed for surface development activities. Noxious weeds are plants that are designated by a Federal, State, Tribal or county government as injurious to public health, agriculture, recreation, wildlife, or property. A noxious weed is commonly defined as a plant that grows out of place and is competitive, persistent, and pernicious (James et al. 1991). Invasive weeds include plants that are not listed as noxious, but are not native to a particular region. Many consider a plant invasive if it has been introduced into an environment where it did not evolve. As a result, invasive plants do not have any natural enemies (e.g. herbivores or other plants) to limit their reproduction. Both invasive and noxious weeds can spread through areas undeterred, producing significant changes to native vegetation communities. The most common locations for noxious and invasive weeds include existing disturbance areas such as well pads, roadsides, pipeline ROWs, adjacent washes, and areas where overgrazing has disturbed native species. Roads may be the first point of entry for exotic species into a new landscape, and may serve as a corridor for plants moving farther into the landscape (Forman and Alexander 1998, Gelbard and Belnap 2003). Recreational activities, livestock grazing, and oil and gas development all have the potential to contribute to the spread and effects of noxious and invasive weeds. In addition, recreational activities along the lakeshore and on the lake have the potential lead to and increase the presence of aquatic nuisance species such as zebra mussels, quagga mussels, and salt cedar.

Hunting, fishing, and boating activities also contribute to noise and visual impacts and subsequent displacement of wildlife.

Surface disturbance from the construction of future oil and gas well pads, access roads, pipelines, and other production facilities on State, Tribal and private lands will incrementally increase the loss and fragmentation of wildlife habitats. Similarly, future oil and gas development will contribute to wildlife displacement from or avoidance of disturbed areas. When displaced, wildlife individuals could move into less suitable habitats or into habitats where inter- and intra-specific competition for resources may occur.

### Conclusion and Determination

This biological assessment evaluated 12 species for possible effects as a result of the proposed project. The analysis resulted in the effects determinations presented in **Table 2**.

**Table 2. Proposed Project Effects Summary**

Endangered Species	
Gray wolf ( <i>Canis lupus</i> )	No effect
Whooping crane ( <i>Grus americana</i> )	Not likely to adversely affect
Black-footed ferret ( <i>Mustela nigripes</i> )	No effect



Interior least tern ( <i>Sterna antillarum</i> )	Not likely to adversely affect
Pallid sturgeon ( <i>Scaphirhynchus albus</i> )	Not likely to adversely affect
<b>Threatened Species</b>	
Piping plover ( <i>Charadrius melodus</i> )	Not likely to adversely affect
<b>Proposed/Candidate Species</b>	
Dakota skipper ( <i>Hesperia dactotae</i> )	Will not contribute to a trend toward Federal listing or cause a loss of viability of the species.
Greater sage grouse ( <i>Centrocercus urophasianus</i> )	No effect
<b>Status Review</b>	
Sprague's pipit ( <i>Anthus spragueii</i> )	Not likely to adversely affect
<b>Monitored</b>	
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Will not contribute to a trend toward re-listing on the ESA
Golden eagle ( <i>Aquila chrysaetos</i> )	Not likely to adversely impact

The “no effect” determinations for gray wolf, black footed-ferret, and greater sage grouse are a result of a lack of habitat for these species in or near the action area.

The “may affect” component of the determination for pallid sturgeon is based on the proximity of the proposed well pad to nearby drainages that are tributary to the Lake Sakakawea. However, Newfield's various conservation measures intended to reduce the potential for petroleum spills or leaks, soil erosion, sediment yield, and stormwater events allowed for the “not likely to adversely affect” conclusion

The “may affect” component of determinations for the whooping crane, interior least tern, piping plover, bald eagle, and golden eagle were based on the potential for these species to migrate over the project area to potential breeding, nesting, roosting, and/or foraging habitat on Lake Sakakawea (and within the steep draws near the well pad) and possibly be affected by visual or noise related disturbances at the project location. However, these temporary noise and visual intrusions would not preclude breeding, nesting, roosting, and/or foraging activities based on Newfield's various conservation commitments related to migratory birds and raptors, thus allowing for the “not likely to adversely affect” conclusion.

The “may affect” component of the determination for Sprague's pipit was based on the loss of 5.95 acres of potential habitat for the species, and the potential for temporary displacement from adjacent breeding and nesting habitats during the construction, drilling, and completion phases of the project. However, Newfield's various conservation commitments related to migratory birds allowed for the “but is not expected to contribute to a trend toward Federal listing or cause a loss of viability of the species.” conclusion.

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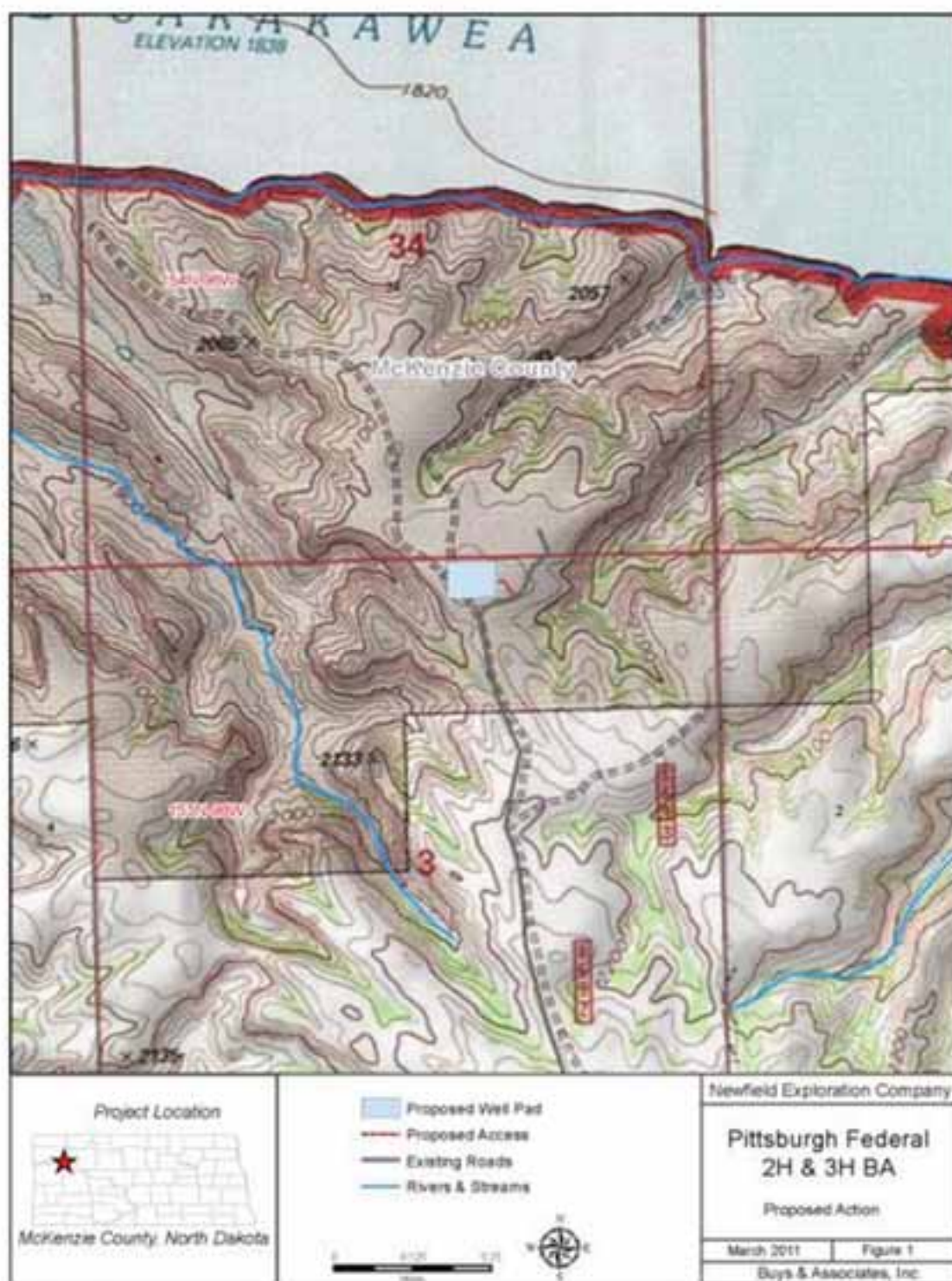
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#### **List of Contacts/Contributors/Preparers**

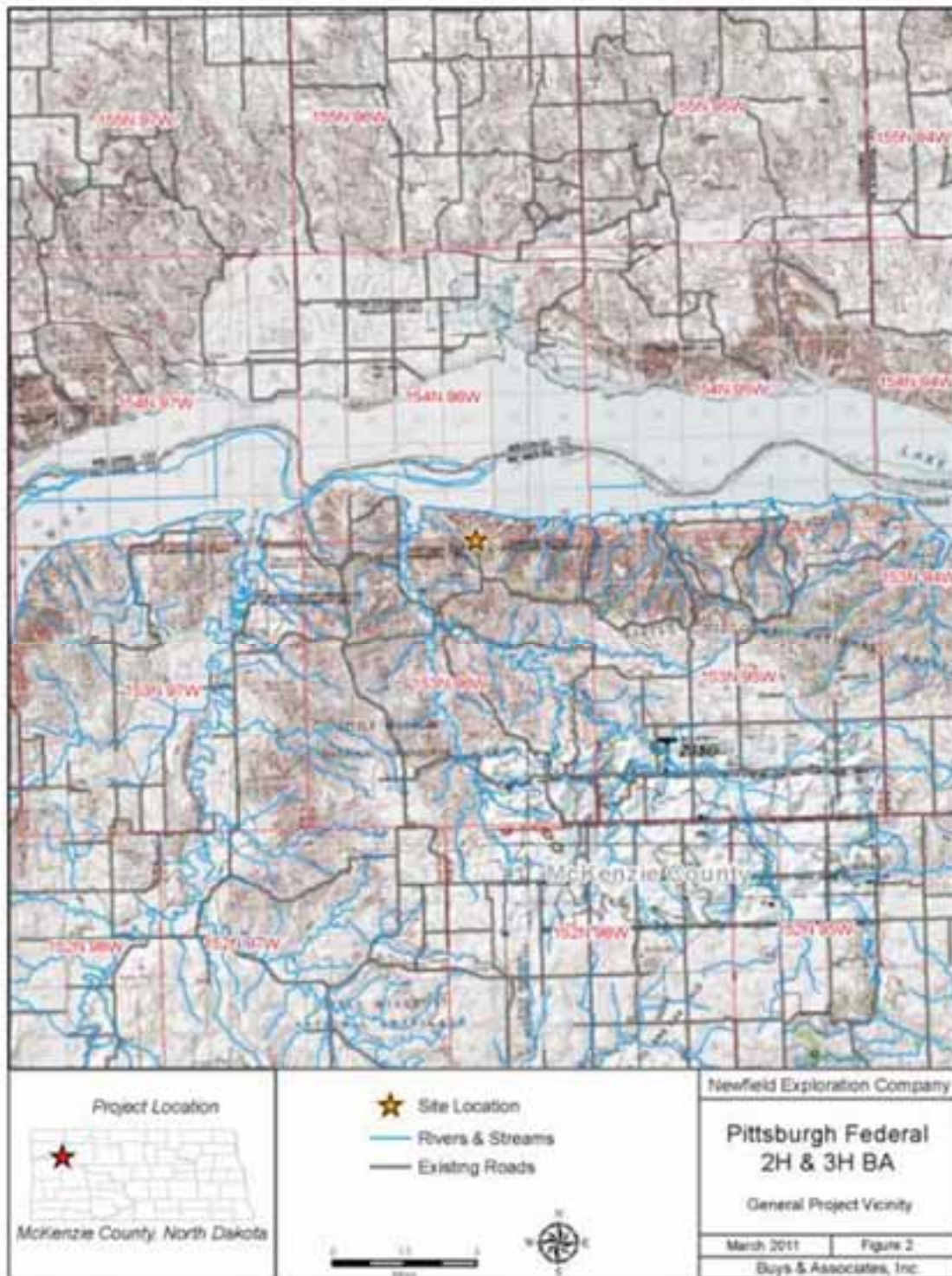
<b>Preparer</b>	<b>Responsibility</b>	<b>Education</b>	<b>Years Professional Experience</b>
Chrissy Lawson, Kleinfelder / Buys and Associates	Proposed Action Author, Assistant Project Manager	M.S. Urban and Regional Planning (in progress), University of Colorado- Denver  B.S. Environmental Design, University of Colorado- Boulder	5

Andrew Antipas, Kleinfelder / Buys and Associates	Senior Author	M.A., Biology/Ecology, Binghamton University  B.S., Biology / Environmental Science, Millersville University	19
Dawn Martin, Kleinfelder / Buys and Associates	Senior Author/Project Manager	M.S., Wildlife Biology B.S., Natural Resources	14

## **Biological Assessment Figures**











# **Appendix K**

## **Consultation Correspondence for Pittsburgh Federal 2H and 3H Environmental Assessment**

## **Pre-Scoping Notification - Pittsburgh Federal 2H and 3H Environmental Assessment**

March 24, 2011

Dear Interested Party:

The United States Army Corps of Engineers (Corps) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). The Corps is considering the approval of two exploratory oil and gas wells, proposed by Newfield Production Company (Newfield), on Corps-owned and administered land in northeastern McKenzie County, North Dakota. The two wells, Pittsburgh Federal 153-96-3-2H and Pittsburgh Federal 153-96-3-3H, would be co-located on one well pad at the following surface location: NW  $\frac{1}{4}$  of the NE  $\frac{1}{4}$  of Section 3, T153N, R96W. (See **Figures 1 and 2**) Each well bore would be located within a separate 640-acre spacing unit. Approximately 208 feet (0.04 miles) of new access road would be constructed in Section 3, T154N, R96W off of an existing road to access the well pad. The road would be constructed within a 40-foot-wide corridor, with a final running surface of up to 16 feet. The drilling of this site is proposed to begin as early as late-summer or fall of 2011.

To ensure that social, economic, and environmental effects are analyzed accurately, formal solicitation of your views and comments on the proposed project will be requested in May of 2011. At that time, we will be interested in existing or proposed developments that should be considered in connection with the proposed project. We will also ask for your assistance in identifying any property or resources that you own, manage, oversee, or otherwise value that might be adversely impacted. Finally, we will be interested in mitigation measures pertaining to any potential impacts.

Contact Kleinfelder / Buys and Associates, Inc., a third-party contractor (information below), to address any preliminary concerns. Please send your preliminary replies (optional) and requests for additional project information to:

Kleinfelder / Buys and Associates, Inc.  
ATTN: Chrissy Lawson  
300 E. Mineral Avenue  
Littleton, CO 80122-2655  
(303) 781-8211  
[clawson@kleinfelder.com](mailto:clawson@kleinfelder.com)

Any specific questions for the Corps can be directed to:  
U.S. Army Corps of Engineers  
Garrison Project Office  
Attn: Charles Sorenson  
P.O. Box 527  
Riverside, ND 58565  
(701) 654-7411, ext. 232  
[Charles.G.Sorenson@usacg.army.mil](mailto:Charles.G.Sorenson@usacg.army.mil)



STATE  
HISTORICAL  
SOCIETY  
OF NORTH DAKOTA

Jack Dainoff  
Governor of North Dakota

North Dakota  
State Historical Board

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Director  
Tourism Division

Kelly Schmidt  
State Treasurer

Arvin A. Jaeger  
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Mark A. Zimmerman  
Director  
Parks and Recreation Department

Ernest Ziegert  
Director  
Department of Transportation

Merlan E. Paeverud, Jr.  
Director

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February 1, 2011

Mr. Steve Gilbert  
Department of the Army  
Corps of Engineers, Omaha District  
106 South 15<sup>th</sup> Street  
Omaha NE 68102-1618

ND SHPO Ref: 11-0617 COE Newfield Exploration Company's Pittsburg  
Federal 153-96-3-2H and Pittsburg Federal 153-96-3-3H Well Pads in portions  
of [T153N R96W Section 3 and T154N R96W Section 34] McKenzie County,  
North Dakota

Dear Mr. Gilbert,

We received ND SHPO Ref: 11-0617 COE Newfield Exploration Company's  
Pittsburg Federal 153-96-3-2H and Pittsburg Federal 153-96-3-3H Well Pads in  
portions of [T153N R96W Section 3 and T154N R96W Section 34] McKenzie  
County, North Dakota. We concur with a "No Historic Properties Affected"  
determination, provided the pipelines and utilities for these wells do not impact  
sites 32MZ1246, 32MZ1247, and 32MZ1248 on USFS lands (USFS Road 8698)  
to the south of the well pad area. If pipelines and utilities for these well pads will  
effect these sites, then USFS Archaeologist Merv Floodman in Watford City  
should be consulted for advice regarding routing and monitoring.

Please include the ND SHPO Reference number listed above in any further  
correspondence for this specific project. If you have any questions please contact  
Susan Quinnell, Review and Compliance Coordinator at (701) 328-3576, e-mail  
squinnell@nd.gov

Sincerely,

Merlan E. Paeverud, Jr.  
State Historic Preservation Officer  
(North Dakota)

C: Merv Floodman





REPLY TO:  
ATTENTION OF:  
North Dakota Regulatory Office

DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, OMAHA DISTRICT  
NORTH DAKOTA REGULATORY OFFICE  
1813 SOUTH 12<sup>TH</sup> STREET  
BISMARCK ND 58504-0649  
March 31, 2011

KleinfelderGlays and Associates, Inc.  
ATTN: Chippy Lawson  
300 East Mineral Avenue  
Littleton, Colorado 80122-2856

Dear Mr. Lawson:

This is in response to a letter received March 28, 2011 requesting Department of the Army, U.S. Army Corps of Engineers (Corps) comments regarding the proposed preparation of two (2) oil and gas wells on a single well pad (Pittsburg Federal #153-96-3-2H & #153-96-3-3H) located in the NW14NE1/4 of Section 3, Township 153 North, Range 96 West, McKenzie County, North Dakota by Newfield Production Company. Also included is the construction of approximately 200 feet of new access road.

Corps Regulatory Offices administer Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Section 10 of the Rivers and Harbors Act regulates work in or affecting navigable waters. This would include work over, through, or under Section 10 water. Section 10 waters in North Dakota include the Missouri River (including Lake Sakakawea and Lake Oahe), Yellowstone River, James River south of Jamestown, North Dakota, Bois de Sioux River, Red River of the North, and the Upper Des Lacs Lake. Section 404 of the Clean Water Act regulates the discharge of dredge or fill material (temporarily or permanently) in waters of the United States. Waters of the United States may include, but are not limited to, rivers, streams, ditches, coulees, lakes, ponds, and their adjacent wetlands. Fill material includes, but is not limited to, rock, sand, soil, clay, plastic, construction debris, wood chips, overburden from mines or other excavation activities and materials used to create any structure or infrastructure in waters of the United States.

For any proposed well where the well line and/or bottom hole is under or crosses under Lake Sakakawea, regardless of depth, we require that project proponent provide a DA permit application (ENG Form 4345) to the Corps.

Enclosed for your information is the fact sheet for Nationwide Permit 12, Utility Line Activities. Pipeline projects are already authorized by Nationwide Permit 12 provided the utility line can be placed without any change to pre-construction contours and all other proposed construction activities and facilities are in compliance with the Nationwide's permit conditions and 401 Water Quality Certification is obtained. Please note the pre-construction notification requirements on page 2 of the fact sheet. If a project involves any one of the seven notification requirements, the project proponent must submit a DA application. Furthermore, a project must also be in compliance with the "Regional Conditions for Nationwide Permits within the State of North Dakota", found on pages 12 and 13 of the fact sheet.

With respect to road construction and/or upgrades, find enclosed for your information is the fact sheet for Nationwide Permit 14, Linear Transportation Projects. Road crossings are already authorized by Nationwide Permit 14 provided the discharge does not cause the loss of greater than 1/2 acre of waters of the United States per crossing and all other proposed construction activities are in compliance with the Nationwide's permit conditions. Please note the pre-construction notification requirements on the front page of the fact sheet. If a project involves (1) the loss of waters of the United States exceeding 1/10 acre per crossing; or (2) there is a discharge in a special aquatic site, including wetlands, the project proponent must submit a DA application prior to the start of construction. Please reference General Condition 27, Pre Construction Notification on page 8 of the fact sheet. Furthermore, a project must also be in compliance with the "Regional Conditions for Nationwide Permits within the State of North Dakota", found on pages 11 and 12 of the fact sheet.



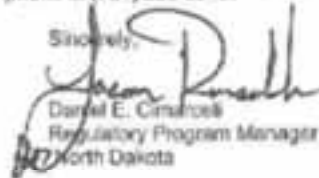
In the event your project requires approval from the U.S. Army Corps of Engineers and cannot be authorized by Nationwide Permits(s), a Standard or Individual Permit will be required. A project that requires a Standard or Individual Permit is intensely reviewed and will require the issuance of a public notice. A Standard or Individual Permit generally requires a minimum of 120 days for processing but based on the project impacts and comments received through the public notice may extend beyond 120 days.

This correspondence letter is neither authorization for the proposed construction nor confirmation that the proposed project complies with the Nationwide Permits(s).

If any of these projects require a Section 10 and/or Section 404 permit, please complete and submit the enclosed Department of the Army permit application (ENG Form 4345) to the U.S. Army Corps of Engineers, North Dakota Regulatory Office, 1513 South 12<sup>th</sup> Street, Bismarck, North Dakota 58504. If you are unsure if a permit is required, you may submit an application; include a project location map, description of work, and construction methodology.

If we can be of further assistance or should you have any questions regarding our program, please do not hesitate to contact this office by letter or phone at (701) 265-0015.

Sincerely,



Daniel E. Cimachuk  
Regulatory Program Manager  
North Dakota

Enclosures  
ENG Form 4345  
Fact Sheet NWP 12 and NDP 14





DEVELOPMENT  
DESCRM  
MC-208

## United States Department of the Interior



BUREAU OF INDIAN AFFAIRS  
Great Plains Regional Office  
115 Fourth Avenue S.E.  
Albuquerque, South Dakota 57401

APR 05 2011



Chrissy Lawson  
Kleinfelder/Byus and Associates, Inc.  
300 E. Mineral Avenue  
Littleton, Colorado 80122-2655

Dear Ms. Lawson:

We received your letter regarding the two proposed exploratory oil and gas wells and new access road in McKenzie County, North Dakota. We have considered the potential for both environmental damage and impacts to archaeological and Native American religious sites on lands held in trust by the Bureau of Indian Affairs, Great Plains Region. You should be aware, however, that Tribes or Tribal members may have lands in fee status near the site of interest. These lands would not necessarily be in our databases, and the Tribes should be contacted directly to ensure all concerns are recognized. The action considered has the following notification date and project location:

- March 24, 2011 The Two Wells, Pittsburgh Federal 153-96-3-2H and Pittsburgh Federal 153-96-3-3H would be co-located on one well pad at the surface location: NW1/4NE1/4 of Section 3, T153N, R56W  
A new access road would be located at: Section 3, T154N, R96W

We have no environmental objections to this action, as long as the project complies with all pertinent laws and regulations. Questions regarding environmental opinions and conditions can be addressed to Jeffrey Davis, Environmental Protection Specialist, at (605) 226-7656.

We also find that the listed action will not affect cultural resources on Tribal or individual landholdings for which we are responsible. Methodologies for the treatment of cultural resources now known or yet to be discovered – particularly human remains – must nevertheless utilize the best available science in accordance with provisions of the Native American Graves Protection and Repatriation Act, the Archaeological Resources Protection Act of 1979 (as amended), and all other pertinent legislation and implementing regulations. Archaeological concerns can be addressed to Dr. Carson N. Murdy, Regional Archaeologist, at (605) 226-7656.

Sincerely,

*Marilyn Berlin*  
ACTING Deputy Regional Director - Indian Services



**NORTH DAKOTA**  
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION  
Gold Seal Center, 918 E. Divide Ave.  
Bismarck, ND 58501-1947  
701.328.5200 (fax)  
www.ndhealth.gov



April 13, 2011

Kleinfelder / Buys & Associates, Inc.  
ATTN: Chrissy Lawson  
300 E Mineral Avenue  
Littleton, CO 80211-2655



Re: Pittsburgh Federal 2H and Pittsburgh Federal 3H Proposed Oil and Gas Wells  
McKenzie County, North Dakota

Dear Ms. Lawson:

This department has reviewed the information concerning the above-referenced project submitted under date of March 24, 2011, with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. Development of the production facilities, any access roads, pipelines or well pads should have a minimal effect on air quality provided measures are taken to minimize fugitive dust. However, operation of the wells has the potential to release air contaminants capable of causing or contributing to air pollution. The owner/operator must register the wells with the Department within 90 days of completion. The owner/operator should contact the Division of Air Quality at (701) 328-5188 to determine adequate flare/stack heights or emission controls.
2. Aggregate to be used for road construction should not contain any erionite. Aggregate sources should be tested for erionite following guidelines found at [www.ndf.health.gov/EHS/Erionite](http://www.ndf.health.gov/EHS/Erionite). For questions regarding erionite testing, please call Mark Dible at 701-328-5188.
3. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.
4. Oil and gas related construction activities disturbing five or more acres are required to have a permit to discharge storm water runoff until the site is stabilized by the reestablishment of vegetation or other permanent cover. Further information on the storm water permit may be obtained from the Department's website or by calling the Division of Water Quality (701-328-5210). Also, cities may

Environmental Health  
Section Chief's Office  
701.328.5150

Division of  
Air Quality  
701.328.5188

Division of  
Municipal Facilities  
701.328.5211

Division of  
Waste Management  
701.328.5166

Division of  
Water Quality  
701.328.5210

Printed on recycled paper.

Ms. Chrissy Lawson

2.

April 13, 2011

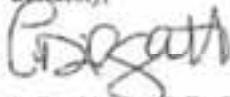
impose additional requirements and/or specific best management practices for construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.

These comments are based on the information provided about the project in the above-referenced submittal. The U.S. Army Corps of Engineers may require a water quality certification from this department for the project if the project is subject to their Section 404 permitting process. Any additional information which may be required by the U.S. Army Corps of Engineers under the process will be considered by this department in our determination regarding the issuance of such a certification.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,



L. David Glan, P.E., Chief  
Environmental Health Section

LDG:cc

Attach.

cc: Mark Dible, Division of Air Quality



### Construction and Environmental Disturbance Requirements

These represent the minimum requirements of the North Dakota Department of Health. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect the waters of the State of North Dakota. All projects will be designed and implemented to restrict the losses or disturbances of soil, vegetative cover, and pollutants (chemical or biological) from a site.

#### **Soils**

Prevent the erosion of exposed soil surfaces and trapping sediments being transported. Examples include, but are not restricted to, sediment dams or berms, diversion dikes, hay bales as erosion checks, riprap, mesh or burlap blankets to hold soil during construction, and immediately establishing vegetative cover on disturbed areas after construction is completed. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, or land resources will be protected against compaction, vegetation loss, and unnecessary damage.

#### **Surface Waters**

All construction which directly or indirectly impacts aquatic systems will be managed to minimize impacts. All attempts will be made to prevent the contamination of water at construction sites from fuel spillage, lubricants, and chemicals, by following safe storage and handling procedures. Stream bank and stream bed disturbances will be controlled to minimize and/or prevent silt movement, nutrient upsurges, plant dislocation, and any physical, chemical, or biological disruption. The use of pesticides or herbicides in or near these systems is forbidden without approval from this Department.

#### **Fill Material**

Any fill material placed below the high water mark must be free of top soils, decomposable materials, and persistent synthetic organic compounds (in toxic concentrations). This includes, but is not limited to, asphalt, tires, treated lumber, and construction debris. The Department may require testing of fill materials. All temporary fills must be removed. Debris and solid wastes will be removed from the site and the impacted areas restored as nearly as possible to the original condition.



## North Dakota State Water Commission

900 EAST BOULEVARD AVENUE, DEPT 770 • BISMARCK, NORTH DAKOTA 58505-0800  
701-328-2730 • TDD 701-328-2730 • FAX 701-328-3890 • 8473NNET:701-328-4030

April 15, 2011

Kleinfelder/Buys and Associates  
Chrissy Lawson  
300 E Mineral Avenue  
Little, CO 80122-2655

Dear Ms. Lawson:

This is in response to your request for review of environmental impacts associated with the Pre-Scoping Notification – Pittsburgh Federal 2H and 3H Environmental Assessment.

The proposed project have been reviewed by State Water Commission staff and the following comments are provided:

- The property is not located in an identified floodplain and it is believed the project will not affect an identified floodplain.
- It is the responsibility of the project sponsor to ensure that local, state and federal agencies are contacted for any required approvals, permits, and easements.
- All waste material associated with the project must be disposed of properly and not placed in identified floodway areas.
- No sole-source aquifers have been designated in ND.

There are no other concerns associated with this project that affect State Water Commission or State Engineer regulatory responsibilities.

Thank you for the opportunity to provide review comments. If you have any questions, please call me at 328-4969.

Sincerely,

Larry Knudson  
Research Analyst

LJK:dp/1570

JACK DUTHIE, GOVERNOR  
CHAIRMAN

TODD SANDOZ, P.E.  
SECRETARY AND STATE ENGINEER



United States Department of Agriculture



Natural Resources Conservation Service  
P.O. Box 1458  
Bismarck, ND 58502-1458



April 26, 2011

Kleinfelder / Buys and Associates, Inc.  
ATTN: Chrissy Lawson  
300 E. Mineral Avenue  
Littleton, CO 80122-2655

RE: Two exploratory oil and gas wells on one pad. Land owned by Corps  
Pittsburg Federal 153-96-3-2H  
Pittsburg Federal 156-96-3-3H  
McKenzie County, ND

Dear Ms. Lawson:

The Natural Resources Conservation Service (NRCS) has reviewed your letter dated March 24, 2011, regarding two exploratory oil and gas wells, on Corps-owned and administered land in northeastern McKenzie County, North Dakota.

*Important Farmlands* - NRCS has a major responsibility with Farmland Policy Protection Act (FPPA) in documenting conversion of farmland (i.e., prime, statewide, and local importance) to non-agricultural use. It appears your proposed project is not supported by Federal funding or actions; therefore, no further action is required.

*Wetlands* - The Wetland Conservation Provisions of the 1985 Food Security Act, as amended, provide that if a USDA participant converts a wetland for the purpose of, or to have the effect of, making agricultural production possible, loss of USDA benefits could occur. NRCS has developed the following guidelines for the installation of buried utilities. If these guidelines are followed, the impacts to the wetland(s) will be considered minimal allowing USDA participants to continue to receive USDA benefits. Following are the requirements: 1) Disturbance to the wetland(s) must be temporary, 2) no drainage of the wetland(s) is allowed (temporary or permanent), 3) mechanized landscaping necessary for installation is kept to a minimum and preconstruction contours are maintained, 4) temporary side cast material must be placed in such a manner not to be dispersed in the wetland, and 5) all trenches must be backfilled to the original wetland bottom elevation.

Helping People Help the Land  
An Equal Opportunity Provider and Employer



Ms. Lawson

Page 2

NRCS would recommend that impacts to wetlands be avoided. If the project requires passage through or disturbance of a wetland, NRCS can complete a certified wetland determination, if requested by the landowner/operator.

If you have additional questions pertaining to FPPA, please contact Steve Sieler, State Soil Liaison, at (701) 530-2019.

Sincerely,

  
JEROME SCHAAR  
State Soil Scientist/MO 7 Leader



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, OMAHA DISTRICT  
GARRISON PROJECT OFFICE  
201 1<sup>ST</sup> STREET, PO BOX 527  
RIVERDALE, NORTH DAKOTA 58565-0527

December 3, 2010

Mr. Jeffery Towner, Field Supervisor  
U.S. Fish and Wildlife Service  
Ecological Services  
3425 Miriam Avenue  
Bismarck ND 58501

Dear Mr. Towner,

Pursuant to 50 C.F.R. 402.08 this letter formally designates Buys & Associates, Inc. as our non-Federal representative for purposes of Section 7 Consultation under the Endangered Species Act of 1973, as amended, for Newfield Exploration Company's proposed Pittsburgh Federal 2H & 3H exploratory wells. We recognize that the U.S. Army Corps of Engineers retains ultimate responsibility for Section 7 obligations.

The proposed action includes the drilling of two exploratory oil wells on land managed by the U.S. Army Corps of Engineers. The wells are planned adjacent to each other on one (1) well pad in the vicinity of the SW¼ of the SE¼ of Section 34, T154N, R96W and the NW¼ of the NE¼ of Section 3, T153N, R96W, which is about ¼ mile south of Lake Sakakawea.

In accordance with interagency cooperation regulations at to 50 C.F.R. 402.08, non-Federal representatives may be involved in an informal consultation process and may request and receive species lists, prepare biological assessment, and provide information for a formal consultation.

If you have any questions, please feel free to contact me at (701) 654-7411 ext 244 or [heather.k.hundt@usace.army.mil](mailto:heather.k.hundt@usace.army.mil)

Sincerely,

Heather Hundt  
Environmental Compliance Coordinator